A Comparison of Variables in Arizona Marching Band Festival Results

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A COMPARISON OF VARIABLES IN ARIZONA MARCHING BAND FESTIVAL RESULTS

David A. Rickels

Abstract

This study investigated the relationships between scores at high school marching band festivals during the fall 2004 Arizona marching season and 16 contributing variables of participating bands. Directors of 115 schools that participated in such festivals were invited by electronic mail to complete a questionnaire using the internet, and 76% responded (N = 87). Using Pearson product-moment coefficients, ANOVA tests, and t tests, the variables found to have significant relationships with festival scores included marching band budget, total band-program budget, number of part-time assistant/non-certified marching staff, marching band enrollment, total band program enrollment, number of festivals attended, school enrollment, and concurrence of concert band programs. Analyses of the variables of teacher’s years of experience, teacher’s years at current school, number of full-time certified staff instructing the marching band, rehearsal hours per week, school geographic locale, internal program co-participation requirements, school Title I status, or director’s rank of marching band priority among other band programs did not reveal any significant relationships to festival scores.

Competition has been part of the history of the American school band experience since the early national concert band contests beginning in 1923 (Moore, 1972). Competitive activity for high school marching bands experienced substantial growth in the last quarter of the 20th century, which some authors attribute to the growing popularity of competitive drum and bugle corps (Davis, 2000; Rockefeller, 1982). Rogers (1985) found that 60% of marching band directors reported pressure to compete from parents, students, and school administrators, and that 62% of schools surveyed participated in marching competitions. Factors such as adequacy of funding, school enrollment, and band size also influenced directors’ decisions to compete at festivals (Sullivan, 2003). Given this decision to pursue competition by many schools, several authors and researchers recommend examining both how and why directors allocate resources towards marching band and how this allocation benefits the students’ overall music education, as well as how to achieve a “successful” marching band (Dunnigan, 1998; Garrison, 1986; Rockefeller, 1982).
In a study on attitudes toward marching band contests, Rogers (1985) surveyed principals and marching band directors from 421 high schools in all 50 U.S. states. He found a significant difference in the mean annual number of marching contests attended by bands located among six geographic regions of the country, with the West attending the most contests ($M = 2.75$) and the Midwest attending the fewest ($M = 1.00$). Respondents were also asked to rate the importance of six different statements concerning the value of marching contests. Rogers found a significant but low level of correlation ($r$ ranging between .18 and .27) between the value ratings of principals and marching band directors, with principals ranking highest the “value of marching contests in improving public relations for the school” (p. 262), and directors rating highest the value of contests to the benefit of each student’s discipline, responsibility, self-esteem, and other personal benefits. Using stepwise multiple-regression, Rogers also found that the number of yearly awards earned and the size of the annual band budget explained up to 22% of the variance in band directors’ value ratings.

Dawes (1989) examined relationships between marching band activity and concert contest results. He found an inverse relationship between Alabama directors’ degree of educational attainment and the number of marching contests attended. Directors holding advanced degrees beyond a bachelor’s degree attended fewer contests. Younger and less experienced directors achieved fewer division I ratings (highest award category) at concert competitions compared to older and more experienced directors. Directors reported attending similar numbers of marching contests regardless of school enrollment. However, Dawes found a positive relationship between school enrollment and concert competition and sight-reading ratings. Dawes also concluded that there was no relationship between involvement in marching competition and concert band competition ratings.

Davis (2000) examined rehearsal procedures, director characteristics, and characteristics of marching bands in a survey of Georgia high school band directors. Davis found no relationship between contest ratings and specific rehearsal procedures such as length and frequency of rehearsals, but reported significant correlations between ratings and certain characteristics of directors and their bands. Director teaching experience, advanced
education, and time of tenure at their current school correlated positively with ratings, as did band size, size of auxiliary group, and number of directors and assistant instructors.

In analyses of performance scores obtained by questionnaire in the 1997 marching season, Hewitt (2000) examined factors concerning the director's involvement in show design. He found that contest scores were higher when music was custom-arranged for winds or percussion. Results also showed lower scores when the director personally designed the drill. This study of music and drill design accounted for 38% of the variance in scores, leaving 68% attributable to other factors, which Hewitt suggested might include "the size of the band, its staff, budget, the abilities and experience of the band and its director; teaching/rehearsing methodology; and the amount of time spent in rehearsal" (p. 29). Smith (1999) examined some of the factors concerning teacher rehearsal methods in a study of four marching band directors. He found that higher contest ratings correlated positively with detailed behavior observations such as teacher modeling, pacing of student playing time versus teacher input time, specific teacher verbal approval/disapproval feedback, and others.

Sullivan (2003) conducted a descriptive survey of Arizona high school band directors. He reported a significant difference in marching band size between schools of different enrollment size, but not between schools of different geographic localities. Evidence in his study also indicated that the smaller bands experienced difficulty in competing with larger bands due to factors such as perceived bias in the judging and classification systems, as well as availability of resources. Sullivan concluded: "schools that choose to participate should have the resources available to do so" (p. 231). He also recommended further investigation into socio-economic issues involved with band participation in marching festivals.

Purpose

The purpose of this study was to examine the relationship between selected variables and outcomes as measured by Arizona marching festival scores. The variables were selected based on previous findings in the reviewed literature. The following research questions were investigated:
1. Do correlations exist between festival score outcomes and the following continuous variables: teacher's years of experience, teacher's years at current school, marching band budget, total band program budget, rehearsal hours per week, number of full-time certified staff, number of part-time assistant/non-certified marching staff, marching band enrollment, total band program enrollment, or number of festivals attended?

2. Do significant differences exist between mean marching festival scores when differentiated by school enrollment, geographic locale, concurrence of concert band programs, internal program co-participation requirements, or school Title I status?

3. Does the director's rank of program priority among marching band, concert band, jazz band, and chamber ensembles correlate to marching festival score outcome?

In Arizona, the term "festival" is usually associated with an adjudicated event for marching bands. For this study, the terms "festival," "contest," or "competition" in reference to a marching band are all assumed to refer to a venue where marching bands are evaluated by an adjudication panel and assigned a score based on established criteria.

**Method**

In December of 2004, the directors of every Arizona high school marching band that participated in a marching festival sanctioned or sponsored by the Arizona Band and Orchestra Directors Association (ABODA) during the fall 2004 marching season were invited to participate in a survey available via the internet. ABODA provided the list of participating schools and directors' electronic mail addresses. Of the 115 directors' electronic mail addresses provided by ABODA, only one address returned an invalid notification and could not be reconciled. The other 114 invitation messages were delivered successfully. The final return rate from directors of all 115 schools identified by ABODA as festival participants was 76% \((N = 87)\).

Each director was sent an invitation message via electronic mail that contained a hyperlink internet address to the survey.
instrument. One week after the initial survey invitation, a reminder message was sent to non-respondents. The survey consisted of 21 questions, and responses were downloaded directly and securely from the online server database in order to eliminate data-entry errors. Directors were allowed to remain anonymous when taking the survey. However, the survey instrument gave them the option to provide their electronic mail address separately from their survey responses to show their participation. The survey instrument was pre-tested with three Arizona music teachers prior to the full administration and small changes were made to clarify desired response data before launching the full survey.

For this study, respondents reported the highest score their band received during the 2004 marching season. The survey instrument instructed directors to consider only scores received at festivals sanctioned by ABODA; therefore, all scores are assumed to be derived from the same evaluation instrument and criteria. Although the evaluation instrument was constant for all scores reported in this study, this study design does not attempt to analyze the inter-judge reliability in determining those scores, either between competitions or within a judging panel at any single competition. Because the reliability between adjudicators may contribute error to the variance in performance scores that is not accounted for in this design, caution is necessary in interpretations of the results of this study.

The analysis of the research objectives of this study utilized total scores from marching band festivals as the primary dependent variable. Marching bands participating in festivals in Arizona during the 2004 marching season were judged on a scale where five judges contributed weighted caption scores that summed to a total of 100 possible points. Among the five judges, two individuals adjudicated music performance, with each contributing 25% of the total score. The three remaining judges each individually evaluated captions for Music General Effect (15% of total score), Visual Performance (20% of total score), and Visual General Effect (15% of total score). Judges determined a score by using a criterion sheet referenced specifically to their caption. The criterion reference sheets broke down each caption into specific elements, and each element was then delineated into five levels of performance quality that were each assigned point ranges. Specific
verbiage at each level indicated what qualities of performance were necessary to receive a score within the specified ranges.

The summed 100-point score yielded a rating of “I”-Superior (90-100 points), “II”-Excellent (80-89 points), “III”-Good (70-79 points), “IV”-Fair (60-69 points), or “V”-Poor (59 points or below). A rating of Superior with Distinction, or “I+”, could also be awarded if Superior ratings were earned from all five judges. As a matter of state interscholastic regulations at the time, only the final ratings based on the total summed scores were announced or distributed publicly (Arizona Interscholastic Association, 2004b). The directors of each ensemble received only their own band’s scores, and these scores were not announced or otherwise published by ABODA or the festival hosts. The survey instrument for this study asked directors to provide their highest rating from the 2004 season, as well as their highest numerical score. All 87 respondents provided their highest rating, and 68 of the respondents – 59% of the survey population – provided a numerical score. In this analysis, scores were treated as continuous data values. Ratings were treated as nominal data for use in supplemental analyses.

Results

The first research question investigated correlations between the reported festival scores and ten continuous data variables. The results of Pearson product-moment coefficient calculations appear in Table 1 along with means and standard deviations for those variables. For all statistical tests in this study, a probability (alpha) level of .05 or less was used to determine significance.
### Marching Festival Results

#### Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation to score (Pearson’s $r^a$)</th>
<th>Variable mean ($M^b$)</th>
<th>Variable standard deviation ($SD^b$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Years of Experience</td>
<td>.02*</td>
<td>11.02</td>
<td>8.28</td>
</tr>
<tr>
<td>Teacher Years at School</td>
<td>-.08*</td>
<td>5.70</td>
<td>5.38</td>
</tr>
<tr>
<td>Marching Band Budget (dollars)</td>
<td>.41**</td>
<td>7,768.65</td>
<td>12,421.89</td>
</tr>
<tr>
<td>Total Band Program Budget (dollars)</td>
<td>.46***</td>
<td>14,516.28</td>
<td>18,256.20</td>
</tr>
<tr>
<td>Marching Rehearsal Hours/Week</td>
<td>.06*</td>
<td>8.02</td>
<td>3.18</td>
</tr>
<tr>
<td>Number of certified teachers for marching band</td>
<td>.05*</td>
<td>1.37</td>
<td>1.45</td>
</tr>
<tr>
<td>Number of non-certified assistant marching staff</td>
<td>.49***</td>
<td>3.36</td>
<td>2.67</td>
</tr>
<tr>
<td>Number of students in marching band</td>
<td>.48***</td>
<td>83.29</td>
<td>36.25</td>
</tr>
<tr>
<td>Number of total students in band program</td>
<td>.50***</td>
<td>116.15</td>
<td>79.60</td>
</tr>
<tr>
<td>Number of festivals attended</td>
<td>.49***</td>
<td>3.00</td>
<td>1.02</td>
</tr>
</tbody>
</table>

$^a$The correlation analyses include only those cases in the sample that provided both the analyzed variable and the score variable, with $n$ ranging from 62 to 68.

$^b$The means and standard deviations reflect all the cases in the sample where data was provided for that variable, with $n$ ranging from 77 to 87.

* n.s. ($p > .05$), ** $p < .01$, *** $p < .001$.

The variables dealing with length of teacher tenure, length of teaching experience, and number of weekly rehearsal hours did not correlate significantly with festival scores. Although the number of certified teachers involved with the marching band did not
correlate with festival scores, the number of non-certified assistant staff did show a significant moderate positive correlation. Both the marching band budget and total band program budget variables showed a significant positive moderate correlation with festival scores, as did the student enrollment of the marching band and total band program. The number of festivals attended also correlated significantly and positively with festival scores.

It should be noted that some degree of skew was evident in the distribution of all ten continuous variables. The direction of skew was positive for all the variables in Table 1 except for the number of festivals attended, which was negatively skewed. The distribution of festival scores was also somewhat skewed in a negative direction. The variables of marching band budget and total band program budget in particular exhibited considerable variance and positive skew. For marching band budget, the median value was $4,500 and the inter-quartile range was $1,600 to $8,300; for total band program budget, the median value was $9,000 and the inter-quartile range was $3,000 to $18,000. Because of the skew in all the continuous variables, caution should be used in interpreting the correlation analyses as non-linear relationships may exist.

In addition to the correlation analyses, an analysis of variance performed on the marching band budget variable using the festival ratings (rather than scores) as the independent variable showed a significant difference ($n = 77, SS = 2.117 \times 10^9, df = 2, F = 8.1520, p = .0006$) between the amount of money being spent on marching band by schools in each of these rating categories. A post hoc Tukey test showed a significant difference in mean budgets between bands receiving a “I” rating ($n = 21, M = $16,092) and bands receiving a “II” ($n = 41, M = $5,521) or “III” and lower ratings ($n = 15, M = $2,260).

Research question number two investigated significant differences in mean festival scores when examined according to five independent variables using $t$ tests and ANOVA tests.

Respondents reported school enrollment according to five classifications of the Arizona Interscholastic Association (AIA). Schools designated as 5A are those with student enrollment of 1900 or greater, and 4A schools are those with student enrollment of 950 to 1899 (Arizona Interscholastic Association, 2004a). For this study, 3A and smaller schools (2A and 1A) with a student enrollment of 949 or fewer were grouped for analytical purposes because of the
Marching Festival Results

low number of respondents in each of these categories individually. This distribution of a greater number of schools in the higher categories of student enrollment was representative of the survey population of bands participating in festivals during the period in question. An ANOVA test and post hoc Tukey test revealed a significant difference \((n = 64, SS = 202.2237, df = 2, F = 3.3833, p = .0404)\) in mean festival scores between 5A schools \((n = 28, M = 86.51)\) and 3A or smaller schools \((n = 6, M = 80.23)\). The difference in means between 4A schools \((n = 30, M = 86.07)\) and other groups was not significant.

One survey question concerning geographic locale asked respondents to report their location as determined by the National Center for Education Statistics (NCES) using the Johnson coding system (National Center for Education Statistics, 2005). To aid respondents in clarity and consistency of data collection, the online survey instrument included a hyperlink to the NCES website and search database where geographic information as well as school Title I status could be obtained. An ANOVA test found no significant difference in mean festival scores across geographic locales \((n = 65, SS = 267.8433, df = 6, F = 1.4551, p = .2098)\). A t test analyzing mean festival scores between schools reporting yes or no for Title I status also did not reveal a significant difference \((n = 63, t = 1.9195, df = 59.8427, p = .0597)\). However, an additional t test of marching band budgets as the dependent variable using Title I status as the independent variable did show a significant difference \((n = 70, t = 2.8515, df = 37.7640, p = .0070)\) between Title I \((n = 35, M = 3,636)\) and non-Title I \((n = 35, M = 10,283)\) schools in the amount of money budgeted for marching band.

One survey question asked the respondents to choose “one of the following that best describes your situation concerning marching and concert bands.” The three possible responses were: (a) Concert band programs are conducted simultaneously and separately from marching band from the start of the school year; (b) Concert band programs begin sometime after the start of the school year while marching band is still ongoing; and (c) Concert band programs do not begin until marching band is completely or very nearly finished for the season. These choices reflect approaches to starting concert band at the beginning, middle, or end of marching season. An ANOVA test revealed a significant difference \((n = 65, SS = 247.5785, df = 2, F = 4.2648, p = .0184)\) in mean scores between
these approaches. A Tukey post hoc test indicated a significant difference in marching festival scores favoring schools starting concert bands at the beginning \((n = 18, M = 88.77)\) over those starting concert bands at the end \((n = 39, M = 84.60)\) of the marching season, with the middle approach \((n = 8, M = 83.73)\) showing no significant difference from the beginning or end approaches. It should be noted that the low number of responses indicating such a middle approach limits the ability of the analysis to detect any significant relationship. It is also unclear how much a loosely defined middle approach may tend towards the start or end of marching season and resemble the other approaches.

Two survey questions attempted to ascertain the placement of cross-participation requirements on band students. One question asked directors, “Are students in your band program required to participate in marching band in order to participate in another program, such as a concert band or jazz band?” The other asked, “Are students in your band program required to participate in another program such as concert band or jazz band in order to participate in marching band?” Both questions required yes or no responses. Using yes or no response as the independent variable, \(t\) tests did not indicate a significant difference in mean contest scores for either question \((n = 66, t = 1.0844, df = 64, p = .2822\) and \(n = 68, t = -.7295, df = 58.3905, p = .4686\), respectively).

To investigate the third research question, the survey instrument instructed directors to rank their priority of four possible program areas, regardless of whether their current school offered such programs. The four areas were marching band, concert band(s), jazz band(s), and chamber/small ensembles. A Spearman rank correlation (rho) between the director’s rank of marching band priority and festival scores resulted in a correlation of only rho=.0170 \((n = 68, p = .7735)\), indicating no significant relationship.

**Discussion**

The analysis of these data reveals several key factors that may influence marching band festival scores, while at the same time indicating a surprising lack of influence from other factors. It is interesting to note that the director’s years of experience and length
of tenure at the current school showed no significant relationship to score outcome. These findings differ from previous research: Davis (2000) reported a positive relationship between these two variables and festival scores, and Dawes (1989) found that bands with older and more experienced directors generally achieved higher festival ratings. In addition, a higher number of weekly rehearsal hours showed no relationship to higher festival scores, indicating that factors other than the amount of time spent rehearsing could be affecting quality of performance when measured at a festival. This suggests that quality of rehearsal, rather than quantity, may bear a stronger relationship to score outcomes – a relationship that is supported and explored in greater depth by Smith's (1999) study. Further research on specific marching band rehearsal procedures may prove enlightening.

The variables in this study that did show relationships with scores generally break down into three categories. First, there are size variables: school enrollment, marching band size, and total band program size. Second, pedagogical and administrative decisions factor into the equation: integration of concert band and marching band, and the number of festivals attended. Last, there are financial variables: marching budget, total program budget, and the number of assistant staff.

It is in some ways not surprising that size variables are related to scoring success at festival performance, and such a finding is indicated in previous research (Davis, 2000; Sullivan, 2003). Even the early national band contests in 1927 created separate divisions for bands of different school enrollments to compete with like-sized schools (Moore, 1972). Given that school enrollment, marching band size, and overall program size all showed relationships to score outcomes, a correlation matrix was constructed between these three variables alone. As might be expected, significant positive relationships existed between all three variables, indicating that larger schools in Arizona generally have larger band programs ($r = .46$), and larger band programs generally have larger marching bands ($r = .79$). Larger sizes of marching bands and overall band programs could indicate successful teaching, leading to higher rates of recruitment and retention.

With respect to festival outcomes, the size of a marching band could lead to better reception by judges as they apply specific musical criteria in an outdoor setting. Such criteria might include...
overt standards regarding balance, blend, or line continuity, as well as less overt opinions judges may hold about the overall intensity level of sound a marching band "should" produce. Bands of greatly differing size may experience potentially unfair comparison of overt standards, as well as potential bias of judges' personal opinions favoring larger bands. Arizona marching band festivals avoid direct side-by-side comparisons by separating ensembles into divisions according to band size, and other states have similar methods of separating divisions or even separate festivals based on size of band or school enrollment. However, the results of this study still show that the numerical evaluation of larger bands at festivals is generally higher than smaller bands, regardless of these methods of separation.

Pedagogical and administrative decisions by the marching band director are more difficult to address in a questionnaire survey such as this. The correlation between number of festivals attended and scores could be explained in at least two possible ways. First, more festival opportunities may give a band and the students more chances to perfect their performance under pressure. Second, a greater number of festivals attended may indicate a marching band that is more invested in the marching idiom and is better prepared to compete. Either possibility individually or a combination of both could be responsible for the positive relationship between the number of festivals attended and scoring success.

The pedagogical concern regarding the timeliness of integrating concert band programs deserves further study. The finding that schools with concert band programs running concurrently with marching band from the beginning of the school year tend to have significantly higher scores at marching festivals should spark special consideration from those who determine curriculum for music programs. It would seem that a more rounded development of the music student (or at least a more rounded offering of development options) yields better results than doggedly pursuing only the marching band to the exclusion of other idioms for weeks and months at a time. Another pedagogical decision that should be noted is that cross-participation requirements such as making marching band mandatory for all band students did not have a significant relationship to festival scores.

The final category of significant variables in this study can be the most difficult to change. The financial commitment to the
Marching band program is a complex decision that is made at various levels by the school, district, parents, students, and director. This study shows that the availability and assignment of resources (including instructional staff) to the marching band carry some strong positive relationships with score outcomes. Although the number of certified teachers directing the marching band was not correlated to score outcome, the number of other assistant staff was significantly correlated. One could even consider that the number of festivals attended – previously listed as a pedagogical/administrative decision – is a financial matter of entry fees, transportation, and so forth.

The importance of these financial considerations cannot be underestimated. The advantages of customized show design explored by Hewitt (2000) are likely to be tied closely to the availability of funding to spend on hiring writers for such enhanced music and drill. Davis’ (2000) study reported the number of staff as a factor positively correlated with contest outcomes, a finding that is also evident in this study. If we assume that in most cases these individuals are not volunteers, this number of staff hired to teach the marching band students is also likely to be dependent on funding. The number of non-certified assistant staff in particular is more likely to be a consideration of funding available at the lower levels of a band organization and its support groups, as opposed to the number of certified teachers that is likely to be set at higher administration levels.

Such a clear indication of the relationship between financial factors and score outcomes has implications for the way in which the music education profession constructs evaluation systems by which schools are rated or compared to one another. Schools may not experience equal conditions with respect to funding or ability to raise funds, and a disadvantage in this area may carry over into lack of success in a competitive setting. This basic inequity should be considered not only when separating bands into different classifications, but also when creating the standards by which bands of differing classifications are adjudicated. Simply separating the bands is not enough: the criteria for each classification must set achievable standards so that the students can experience success.

Further research is needed concerning marching band festivals. It is evident from the findings in this and other studies that several
factors other than a band's actual performance are related to scoring success. This study dealt with scores from only one circuit of competition, so it may have limited generalizability. Additional research could sample similar variables and scores from a national circuit of competition, or across several states. Further detailed multivariate or factor analyses could also uncover additional relationships between variables.

Participation in marching band festivals is a decision undertaken by a great number of music students and their directors every year. While these participants may choose to enter such festivals for a variety of reasons, their entrance links them into a system where success is determined numerically and where factors beyond the student's performance may impact their numeric outcome. If competition is to be the chosen vehicle, then marching band directors and festival planners alike would benefit from an increased understanding of the non-performance variables related to festival success. This increased understanding should directly benefit the marching band student musicians through better planning of marching programs and greater equity in construction of festival evaluation systems. It should then be the students who are ultimately the most important factor in the final determination of success at a marching band festival.

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CONTRIBUTORS

EDMUND A. BOWLES has written extensively for over 50 years in the areas of late medieval musical instruments and performance practices, musical activities at European court festivals of state, the impact of technology on instrument-building, and the history of the timpani. His books include *Musik-leben im Jahrhundert*, *La Pratique musicale au moyen âge/Musical Performance in the Late Middle Ages*, *Musical Ensembles in Festival Books: An Iconographical & Documentary Survey*, and *The Timpani: A History in Pictures and Documents*. Of interest to readers of this Journal, Dr. Bowles wrote an article, "The Impact of Turkish Military Bands on European Court Festivals in the 17th and 18th Centuries" that appeared in *Early Music* 34 (2006).

CRAIG CUMMINGS is chair of the department of music theory, history, and composition at Ithaca College, where he has taught for twenty years. His work on Husa's music includes a chapter in *Karel Husa--A Composer's Life in Essays and Documents*, edited by Mark A. Radice, a recently published article on the composer's early serial pieces, *Poème and Mosaïques*, and several conference presentations on Husa's chamber works, *Sonata a Tre* and *Variations*. Cummings currently is finishing his textbook, *A Practical Approach to Twentieth-Century Musical Skills*, to be published by Scarecrow Press.

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