

# **Leadership Effectiveness of Collegiate Aviation Program Leaders: A Four-frame Analysis**

**Ryan S. Phillips**

Lewis University

**Mark A. Baron**

The University of South Dakota

## **Abstract**

The purpose of this study was to examine the perceived leadership effectiveness of aviation program leaders at higher education institutions utilizing the four leadership frames of Drs. Lee Bolman and Terrence Deal. A frame is a tactic which allows an individual to gain a perspective on a given situation. The four frames of Bolman and Deal are the structural, human resources, political, and symbolic frames. An anonymous online survey, developed using the Leadership Orientation Instrument of Bolman and Deal, was sent electronically to aviation faculty and staff followers at University Aviation Association higher education institutions. Five-point Likert scales were used by aviation faculty and staff to assess the perceived leadership effectiveness of aviation program leaders. A one-way ANOVA was conducted comparing the perceived leadership effectiveness scores based on the four leadership frames. No significant difference was found in perceived leadership effectiveness based on the primary leadership frame,  $F(3,90) = 1.08, p > .05$ . An additional one-way ANOVA was run comparing the perceived leadership effectiveness scores of the four frame groups (no frames, single frame, paired frames, and multiple frames). A significant difference was found in perceived leadership effectiveness based on the number of frames utilized,  $F(3,222) = 101.93, p < .05$ . Post-hoc tests revealed that aviation program leaders scored higher in perceived leadership effectiveness if they subscribed to the paired frames or multiple frames approaches.

## **Introduction**

Aviation is inherently a high-stakes environment, and if an organization is to be effective it must work as a team and be led by a strong leader. These leader/team interactions must be cohesive for an organization to safely achieve its objectives (Senko, 2010). Additionally, Kutz (1998) stressed the importance of aviation leaders to have a vision that consists of the inputs from followers across the entire organization. In addition to a leader being effective in an organization, the Federal Aviation Administration (FAA) further stresses the importance of leadership in aviation not only in the United States but past our borders on a global scale (FAA, 2009).

The academic environment is also challenging and ever-changing as well. Leaders in this field must be able to balance budgets, meet the demands of superordinates (presidents, provosts, deans, and governing boards), and effectively empower their employees to achieve college and department goals (Napier, 1996; Wolverton & Ackerman, 2006). Aviation academic leaders face the aforementioned challenges

imposed by both the aviation industry and academic arenas. These individuals must successfully find ways to prepare graduates for the challenging industry while negotiating with the rigors of academia at the same time (Phillips, Ruiz, & Mehta, 2006). In order to meet these challenges an effective leadership strategy must be put in place (Phillips, 2012).

One such leadership strategy was proposed by Drs. Lee Bolman and Terrence Deal (2008). Their strategy incorporates the use of four different leadership frames to effectively lead in a complex environment. A frame is a tactic which allows a leader to view an issue from a particular perspective. The first frame is the structural which deals with the physical makeup of an organization and how it is organized to accomplish a task. The second frame is human resources which focuses on how leaders interact with their people and provides them with what they need (resources, encouragement, etc.) (Bolman & Deal, 2010). The next frame is the political frame which focuses on the competition over scarce resources both inside and outside of the organization. The final frame is the symbolic frame which attaches an organization's culture to symbols of meaning for the leaders and their followers (Bolman & Deal, 2006). McDonald's restaurant has the golden arches and Southwest Airlines has the heart symbol. These symbols embody what it means to be a part of an organization and its culture. For the purposes of this study, the primary leadership frame is the frame a leader utilizes the most. In a 2012 study by Phillips, data analysis revealed that aviation program leaders utilize the human resources frame the most, followed by the structural, political, and symbolic frames, respectively.

Using Bolman and Deal's (2003) framework, this study specifically addresses the following questions:

1. How effective are aviation program leaders perceived to be by faculty and staff?
2. What differences in perceived leadership effectiveness exist based on the primary leadership frame used?
3. What differences in perceived leadership effectiveness exist based on the number of leadership frames used (no frames, single frame, paired frames, and multiple frames)?

## **Review of Literature**

Leadership is one of the most studied and documented subjects (Manning & Curtis, 2011). Carlyle (1840) was one of the first to look for common traits among successful leaders. He hoped to identify a common thread or trait which could be used to unlock the secrets of great leadership. Over time, many additional leadership theories have abounded which include trait, behavioral, contingency, situational, path goal, power and influence, transactional and transformational, and cultural leadership theories (Bass, 1985; Bensimon, Neumann, & Birnbaum, 1989; Downton, 1973; Fiedler, 1964; Hemphill, 1950; Hershey, Blanchard, & Johnson, 2007; House, 1977; Lewin & Lippit, 1938; Lick, 2002; Stogdill, 1948, Vroom & Yetton, 1973). This study utilized the four

frames theory of Bolman and Deal (2003). This leadership theory was selected because it synthesizes many of the organizational leadership theories previously mentioned, and it is highly adaptable to differing leadership environments (Bolman & Deal, 1990; Little, 2010). Each theory seeks to determine what makes leaders effective in navigating the challenges they face within their fields. Both the aviation industry and higher education offer unique challenges to leaders, and an aviation program leader must successfully handle challenges from both groups.

Regarding the aviation industry, many challenges have surfaced to complicate aviation industry operations. In his 2009 address, Giovanni Bisignani, former Director General and Chief Executive Officer of the International Air Transport Association, highlighted just some of the challenges facing the global aviation industry. Oil prices escalated to a peak of \$144 per barrel, an increase in labor productivity occurred, noise and carbon emission standards were tightened, and all of these changes occurred rapidly due to these global events and the leadership of industry professionals (Bisignani, 2009). All of these changes adversely affected the aviation industry and have added unique challenges to industry organizations to be effective. According to the *Federal Aviation Administration Economic Impact Report* of 2011, aviation serves as the conduit to further business and commerce on a global scale. These large-scale operations have provided many opportunities to the country and world. With these opportunities, however, come many challenges that need to be addressed by leaders in the industry and field.

Leaders in a higher education setting must also deal with multitudes of challenges. A study conducted by Wolverton, Gmelch, Wolverton, and Sarros (1999) discovered that some of the challenges facing higher education leaders include assigning faculty workloads (teaching, research, etc.), managing and distributing the department's budget, carrying forward the vision of the dean and higher administrators, setting goals and objectives to achieve the aforementioned vision, etc. These leaders also serve as mentors for faculty and must successfully handle concerns, difficulties, and conflicts that arise among their followers as well. In addition to these daily challenges, leaders also must deal with budgetary shortfalls in higher education which place additional strain on the shoulders of academic leaders (Graham, Heiman, & Williams, 2004). To further complicate matters, a study by Gmelch (2000) discovered that only 3% of 2,000 surveyed had any leadership training before stepping into leadership roles similar to those in aviation higher education.

The aviation program leader must handle both sets of the aforementioned challenges. Many challenges faced in academia are financial, and it is up to the leaders to address these challenges using their leadership skills (Middlehurst, 2010). Many of the challenges facing the aviation industry are also the result of economic factors and safety objectives put in place by the FAA (2009). It is up to aviation program leaders to address these challenges and effectively prepare students for their careers (UAA, 2012). Additionally, aviation program leaders must effectively lead the faculty and staff members of their organizations to obtain the objectives set in place.

One way to evaluate leadership effectiveness and deal with the demands of an ever-changing workforce is to utilize Bolman and Deal's (2008) four frame model (McArdle,

2008; Parry & Horton, 1998). A strong knowledge of the four frames is essential in handling the multitudes of differing tasks and situations that arise in an industry or academic setting.

Before describing each of the four frames, it is essential to further define the terms “frames” and “aviation program leader”. “Frames are both windows on the world and lenses that bring the world into focus. Frames filter out some things while allowing others to pass through easily. Frames help us order experience and decide what to do” (Bolman & Deal, 1997, p. 12). Each frame allows a leader to gain a different perspective on a given situation. For the purposes of this study an “aviation program leader” is the individual who shoulders the main responsibilities for an aviation program (budget, curriculum, vision, mission, etc.). Since institutions are organized differently, this individual could be a dean, department chair, program coordinator, program leader, etc. (Phillips, 2012).

The first frame is structural, and it focuses on how leaders arrange and setup their organizations to accomplish its tasks. This frame is also concerned with the procedures and protocols that leaders and followers must utilize to successfully meet their objectives (Bolman & Deal, 2003). Bolman and Deal also stress the importance of using more than one single frame to evaluate leadership effectiveness. “In a world of increasing ambiguity and complexity, the ability to use more than one frame should increase an individual’s ability to make clear judgments and to act effectively” (Bolman & Deal, 1991, p.519).

The second frame is the human resources frame. “The human resource frame highlights the relationship between people and organizations. Organizations need people (for their energy, effort, and talent), and people need organizations (for the many intrinsic and extrinsic rewards they offer), but their needs are not always well aligned. When the fit between people and organizations is poor, one or both suffers: individuals may feel neglected or oppressed, and organizations sputter” (Bolman & Deal, 1997, p. 119). This frame is focused on leaders providing the required support to followers so they may have adequate resources to succeed in the organization.

The political frame is concerned with the use and distribution of power. Leaders must compete for scarce resources that exist in the organization’s environment. Some of these resources include time, money, supplies, equipment, facilities, etc. This frame is important because leaders must form coalitions and avoid pitfalls while building a base of power to best serve their followers (Bolman & Deal, 2003).

The final frame is the symbolic frame. This frame is utilized to promote a culture in an organization. One way to do this is through the use of symbols. A symbol is something that everyone in an organization can readily identify with and take pride in. Although a symbol is important, leaders of organizations must be the one to attach meaning to the symbol. Herb Kelleher, former CEO of Southwest Airlines, would show his employees what it meant to be a Southwest employee through his example (Freiberg & Freiberg, 1996). The leader in the symbolic frame “...believes that the most important

part of a leader's job is inspiration---giving people something they can believe in" (Bolman & Deal, 2003, p. 329).

Many additional studies have utilized Bolman and Deal's theory in academia, but after extensive literature review, none have looked at aviation higher education specifically (Beck-Frazier, 2005; Burks, 1992; Cantu, 1997; Chang, 2004; DeFrank-Cole, 2003; Englert, 2008; Goldsmith, 2005; Griffin, 2005; Guidry, 2007; Little, 2010; Maitra, 2007; McArdle, 2008; Sypawka, 2008; Tedesco, 2004; Tingey, 1997). This gap in research served as the catalyst for this study.

**Limitations and Delimitations of the Study.** This study was limited by the number of responses from contacted respondents and by the demographics associated with the population (gender, faculty status, etc.). The results of this study are therefore confined to those responding and do not describe the entire population. The first delimitation of *this study was that it only consisted* of faculty and staff from aviation higher education institutions that are members of the University Aviation Association *to ensure data manageability*. *The second delimitation was that only the Leadership Orientation Instrument (LOI) Other version was administered to respondents.* Doing so prevented the possible loss of paired sample data as is later explained.

## Methodology

### Purpose

The purpose of this study was to examine leadership effectiveness in aviation higher education utilizing the leadership theory of Bolman and Deal (2008). The study focused on the perceived leadership effectiveness derived from faculty and staff evaluations, and answered the following specific research questions:

1. How effective are aviation program leaders perceived to be by faculty and staff?
2. What differences in perceived leadership effectiveness exist based on the primary leadership frame used?
3. What differences in perceived leadership effectiveness exist based on the number of leadership frames used (no frames, single frame, paired frames, and multiple frames)?

### Population

The population for this study consisted of 878 aviation faculty and staff members from approximately 100 University Aviation Association (UAA) member institutions. The UAA is an organization that fosters excellence in collegiate aviation and works to constantly improve the quality of aviation programs (UAA, 2012). Due to these high standards, faculty and staff from member institutions of this organization were selected as the population for this study. It is important to note all subjects were not necessarily

members of the UAA, but they belonged to member institutions. The UAA website provided the basic program and web addresses required to begin further researching faculty and staff contacts. Once the program websites were obtained, searches of the employee directories ensued to develop an email list of faculty and staff members for participation in the survey. A database of faculty member emails was compiled in January of 2012, and it was placed into SurveyMonkey®, an online-based survey administration tool. Furthermore, aviation program leaders were excluded from this study as is later explained, and the population consisted solely of respondent followers.

## **Instrument**

The instrument used to collect these data was the Leadership Orientation Instrument which was developed by Bolman and Deal (1990). Written permission to utilize the instrument was obtained from Dr. Bolman. The survey was developed to identify the frame(s) in use by leaders in various organizations. There are two primary versions of the survey. One is the LOI-Self which is answered by the leader of the organization (aviation program leader) to determine the leadership frames as the individual perceives them. The second section is the LOI-Other and is answered by followers to measure their perceptions of the leadership frame(s) in use by their leader. Both sections seek to measure the frame use of the leader. This study utilized the Other portion of the survey only. Using solely the Other part of the instrument was elected to prevent the sample size from being limited. If the Self and Other portions of the instrument were both utilized at an institution, the result would be a paired sample. If aviation program leaders failed to respond to the Self portion of the instrument, the data collected from the Other portion of the instrument at the same institution would no longer be paired. This would have resulted in losing data from multiple followers who completed the Other portion.

The LOI-Other consists of four sections (Bolman & Deal, 1990). This study used sections I, III, and IV. Section II seeks to further identify leadership sub classifications such as analytic, supportive, powerful, inspirational, organized, participative, adroit, and charismatic. To solely focus on the primary leadership frames and limit the length of the survey, section II was eliminated. Section I consists of eight Likert questions per frame, totaling 32 total questions. Respondents rated the frequency of their leader's structural frame use on a Likert scale where 1 = *Never*, 2 = *Occasionally*, 3 = *Sometimes*, 4 = *Often*, and 5 = *Always*.

Section III focuses on the perceived effectiveness of the leader (Bolman & Deal, 1990). Subjects again rated their leader on a Likert scale of 1 to 5, where 1 is a leader whose effectiveness is ranked in the bottom 20% of all leaders the subject has known (0-20%), 2 is in the next 20% bracket (21-40%), 3 is a leader in the middle 20% bracket (41-60%), 4 is in the next higher bracket (61-80%), and a 5 is a leader whose effectiveness is in the top 20% of all leaders the subject has known (81-100%).

Lastly, Section IV focuses on basic demographic questions with regard to gender and type of position held by the respondent.

## Data Collection and Analysis

Once the population was identified, the email addresses of these individuals were entered into SurveyMonkey® and persons were automatically invited to participate in the study online through an email invitation. This email addressed their individual rights as human subjects in this study and provided a link to the survey. Contacting respondents in this manner ensured confidentiality of the participants and also reduced the possibility of errors occurring in data collection. A reminder email was sent every five days encouraging individuals to take part in the survey. Three total reminders were issued, and the total window for participation was open for 21 days.

Once data collection was complete, statistical analysis was accomplished using the Statistical Package for the Social Sciences (SPSS) software version 19.0. First an analysis was run using the composite mean from Section I of the LOI. The frame with the highest composite mean identified the leadership frame being utilized the most. Second, the number of leadership frames used by a leader was determined by identifying the number of frames having composite means of leaders 4.0 and above. If a subject scored below a 4.0 for a frame, the subject was counted as not using that frame. Therefore, an individual who had no composite mean score greater than 4.0 was classified as *no frames* (used zero of the four frames). An individual who had one composite mean equal to or greater than 4.0 was classified as *single frame* (used one of the four frames). An individual who had two composite means equal to or greater than 4.0 was classified as *paired frames* (used two of the four frames). Lastly, an individual who had three or four composite mean scores equal to or greater than 4.0 was classified as *multiple frames* (used three or four of the frames).

Research question one focused on identifying how effective aviation program leaders are perceived to be by aviation faculty and staff. These data originated from Section III of the LOI and are descriptive in nature. Means and standard deviations were calculated based on the same five-point Likert scale.

The second research question focused on identifying the differences of perceived leadership effectiveness based on the primary frame used by the leader. Subjects were grouped by primary frame utilizing the same method explained in the previous paragraph. Individuals with a 4.0 or higher composite score were considered to subscribe to a frame. Leaders who did not score above a 4.0 composite mean were not used in answering this question. Individuals that had equal composite mean for two or more frames were also not counted. For example, an individual who scored a 4.1 for both the structural and human resources frames would not be considered to utilize one primary frame over the others. This individual would therefore not be counted. After subjects were grouped a Levene test of homogeneity was conducted. Next, a one-way analysis of variance (ANOVA) was performed to determine differences in perceived leadership effectiveness based on each frame orientation. The independent variable was the primary leadership frame, and the dependent variable was the mean of the perceived leadership effectiveness. The ANOVA was run at the .05 level of significance.

Research question three focused on identifying the difference in perceived leadership effectiveness based on the number of leadership frames used (no frames, single frame, paired frames, and multiple frames). Levene and ANOVA tests were once again performed. The independent variable was the number of frames used, and the dependent variable was the mean of the perceived leadership effectiveness. Again, these tests were run at the .05 level of significance.

## Findings

### Response Rate

Of the 878 surveys sent out, 231 were returned. Of this group five were not completely filled in due to technical problems and were discarded from the study. The remaining usable surveys yielded a response rate of 25.7% (226/878), and this generated a confidence interval of 5.62. The Instructional Assessment Resources webpage at the University of Texas (2013) states that the average response rate for an online survey is 30%. Thus this study yielded a slightly reduced response rate.

### Demographic Data

Of the 226 returned surveys, 54 of the respondents were women (23.9%) and 172 were men (76.1%). Of the respondents, 142 (62.8%) were classified as faculty members who serve in a full-time capacity, 13 (5.8%) were adjunct faculty, 62 (27.4%) were staff, and 9 (4.0%) were other.

**Aviation program leader effectiveness.** Section III of the LOI-Other consisted of one question where respondents ranked their leaders on their overall leadership effectiveness (research question 1). The same 1 to 5 Likert scale was used. A selection of 1 is a leader whose effectiveness is ranked in the bottom 20% of all leaders the subject has known (0-20%), 2 is in the next 20% bracket (21-40%), 3 is a leader in the middle bracket (41-60%), 4 is in the next higher bracket (61-80%), and a 5 is a leader whose effectiveness is in the top 20% of all leaders the subject has known (81-100%).

A frequency response was computed for perceived leadership effectiveness. Respondents reported that 21 (9.3%) were in the lowest bracket, 19 (8.4%) were in the 21-40% bracket, 43 (19.0%) were in the 41-60% bracket, 82 (36.3%) were in the 61-80% bracket, and 61 (27.0%) were in the top bracket (see Table 1).

**Differences in perceived leadership effectiveness based on primary leadership frame.** A Levene's test for equality of variances was conducted and the data were determined to be homogenous,  $F(3,90) = .90, p > .05$ . A one-way ANOVA was then conducted to determine the differences in perceived leadership effectiveness based on the primary leadership frame utilized (research question 2). The dependent variable was perceived leadership effectiveness and the independent variable was the primary leadership frame. In order to properly run the ANOVA, data from each respondent were analyzed. For a primary leadership frame to be identified, only individuals who had a



Table 1  
*Perceived Leadership Effectiveness Rating*

Perceived Leadership Effectiveness	Frequency	Valid Percent
Lower 0-20%	21	9.3
Next 21-40%	19	8.4
Middle 41-60%	43	19.0
Higher 61-80%	82	36.3
Top 81-100%	61	27.0
Total	226	100.0

Note:  $n = 226$

Table 2  
*Responses by Primary Leadership Frame*

Frames Utilized	Frequency	Valid Percent	Effectiveness Mean	SD
Human Resource	44	46.8	4.36	0.57
Structural	31	33.0	4.19	0.75
Political	10	10.6	4.50	0.53
Symbolic	9	9.6	4.56	0.73
Total	94	100	4.34	0.65

Note:  $n = 94$

composite mean score in a frame of 4.0 and higher were counted as using that particular frame. Following this process, of the total survey respondents ( $n = 226$ ), 133 had mean scores of 4.0 and higher in a frame. Of these 133 leaders, 39 had frames that had the exact mean score as another frame. These individuals with “tied” scores were removed from the sample. This left 94 total leaders in the pool. Of this group, 31 (33.0%) were structural, 44 (46.8%) were human resource, 10 (10.6%) were political, and 9 (9.6%) were symbolic (see Table 2). Human resource leaders had a perceived leadership effectiveness mean score of 4.36 ( $SD = 0.57$ ). Structural leaders had a perceived leadership effectiveness mean score of 4.19 ( $SD = 0.75$ ). Political leaders had a perceived leadership effectiveness mean score of 4.50 ( $SD = 0.53$ ). Symbolic leaders had a perceived leadership effectiveness mean score of 4.56 ( $SD = 0.73$ ) (see Table 2). Once groupings were complete the one-way ANOVA was conducted comparing the perceived leadership effectiveness scores based on the four leadership frames (structural, human resource, political, and symbolic). No significant difference was found in perceived leadership effectiveness based on the primary leadership frame,  $F(3,90) = 1.08, p > .05$  (see Table 3).

Table 3

*Differences in Perceived Leadership Effectiveness Based on Primary Leadership Frame*

	Sum of Squares	df	Mean Square	<i>F</i>	<i>p</i>
Between Groups	1.36	3	0.46	1.08	.360
Within Groups	37.74	90	0.42		
Total	39.11	93			

Note:  $n = 94$

**Differences in perceived leadership effectiveness based on number of leadership frames utilized.** For research question three, a Levene's test for equality of variances was conducted and was found to be violated for the present data analysis,  $F(3,222) = 29.01$ ,  $p < .05$ . Data were further analyzed using Q-Q plots (see Figures 1-4) and were determined to be normally distributed. A one-way ANOVA was then conducted to determine the differences in perceived leadership effectiveness based on the number of leadership frames used. The dependent variable was perceived leadership effectiveness and the independent variable was the number of leadership frames used. Once again, a 4.0 and higher mean score was used to identify which frames were being utilized. In order to group individuals into the frame categories (no frames, single frame, paired frames, and multiple frames) the same procedure was followed as in research question two. A frequency of response was performed for the 226 leaders, and respondents reported that 92 (40.7%) of leaders used *no frames*, 33 (14.6%) used *single frame*, 24 (10.6%) used *paired frames*, and 77 (34.1%) used *multiple frames* (see Table 4).

Leaders who used no frames had a perceived leadership effectiveness mean score of 2.55, ( $SD = 1.07$ ) (see Table 5). Single frame leaders had a perceived leadership effectiveness mean score of 3.79, ( $SD = 0.55$ ). Paired frame leaders had a perceived leadership effectiveness mean score of 4.42, ( $SD = 0.65$ ), and multiple frame leaders had a perceived leadership effectiveness mean score of 4.61, ( $SD = 0.49$ ).

Once the groupings were complete, the one-way ANOVA was run comparing the perceived leadership effectiveness scores of the four frame groups (no frames, single frame, paired frames, and multiple frames). A significant difference was found in perceived leadership effectiveness based on the number of frames utilized,  $F(3,222) = 101.93$ ,  $p < .05$  (see Table 6). Tukey's Honestly Significant Difference (HSD) Test was used to determine the nature of the differences between the number of leadership frame groups (see Tables 5 and 7). Leaders who utilized a single frame ( $M = 3.79$ , 95% CI [3.59, 3.98]) had a significantly higher perceived leadership effectiveness score than leaders who used no frames ( $M = 2.55$ , 95% CI [2.33, 2.78]),  $p < .05$ . Leaders who utilized paired frames ( $M = 4.42$ , 95% CI [4.14, 4.69]) had a significantly higher perceived leadership effectiveness score than leaders who used a single frame or no frames approach,  $p < .05$ . Leaders who utilized multiple frames ( $M = 4.61$ , 95% CI [4.50, 4.72]) had a significantly higher perceived leadership effectiveness score than leaders who used a single frame or no frames approach,  $p < .05$ . There was no significant difference between leaders who use multiple frames and paired frames,  $p > .05$ . Leaders

who utilize paired and multiple frames had a significantly higher perceived leadership effectiveness score than individuals who used no frames or a single frame, and leaders who used a single frame had a significantly higher perceived leadership effectiveness score than leaders who utilized no frames.

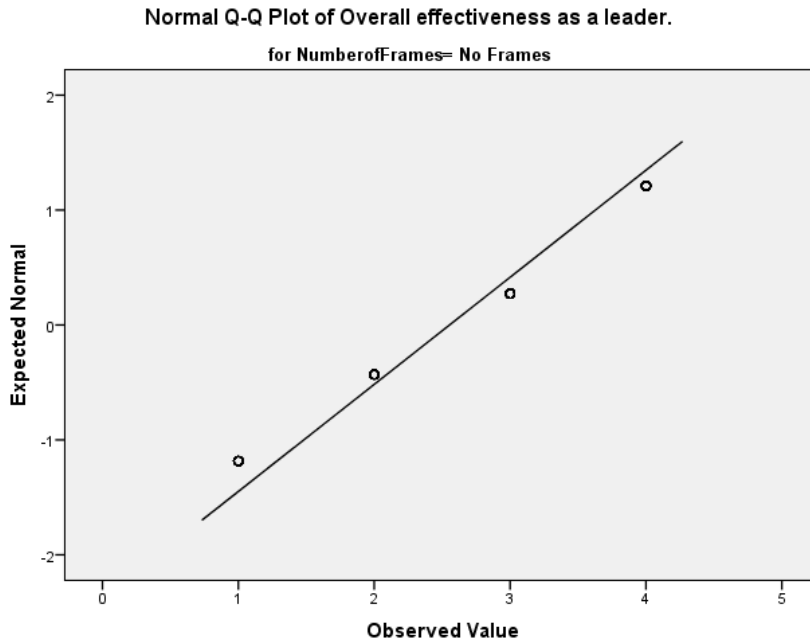


Figure 1. QQ plot for overall effectiveness as a leader – no frames.

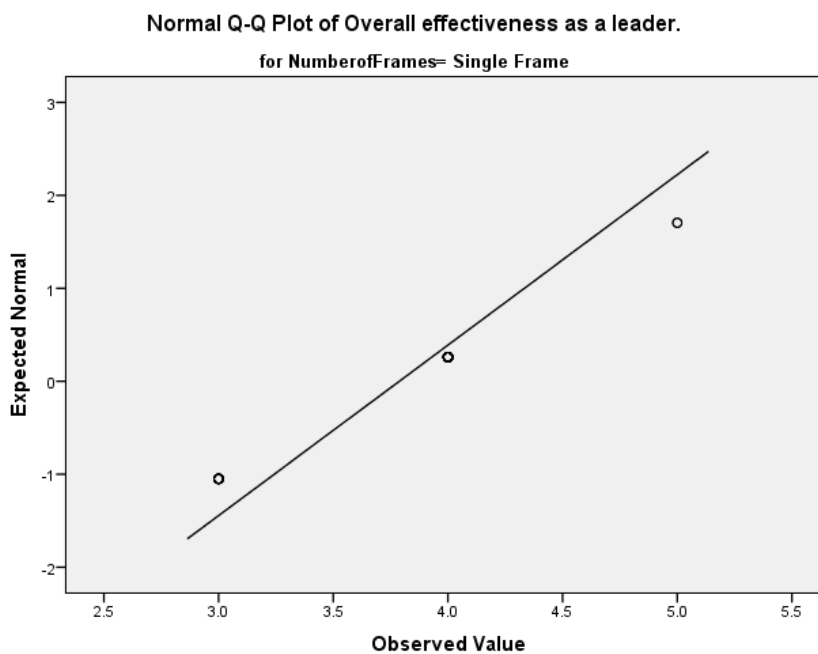


Figure 2. QQ plot for overall effectiveness as a leader – Single frame.

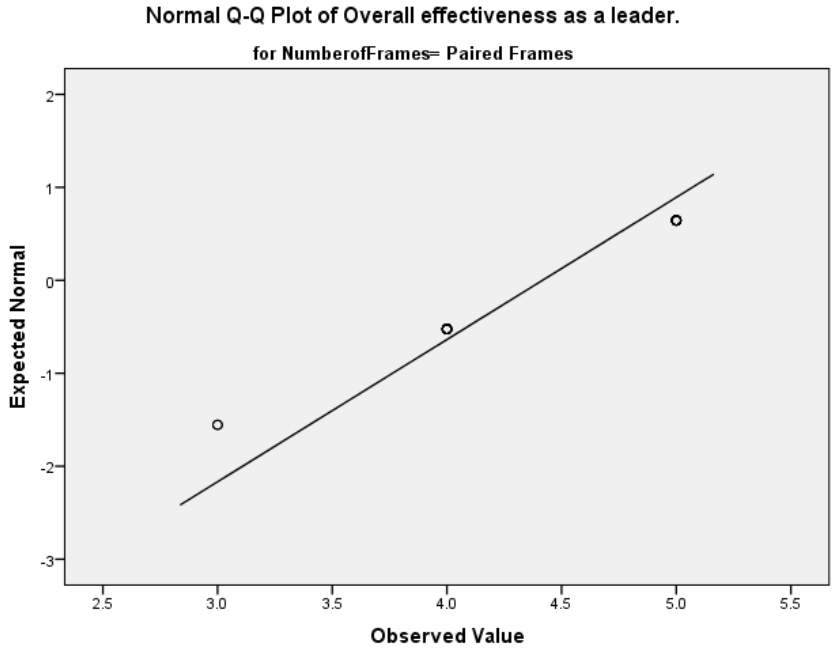


Figure 3. QQ plot for overall effectiveness as a leader – paired frames.

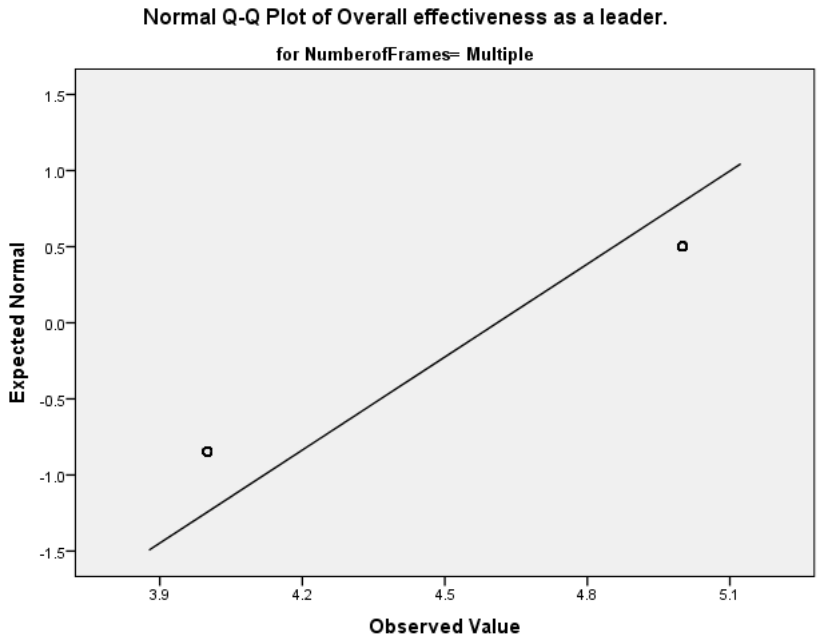


Figure 4. QQ plot for overall effectiveness as a leader – multiple frames.

Table 4

*Perceived Number of Leadership Frames Utilized*

Frames Utilized	Frequency	Valid Percent
No Frames	92	40.7
Single Frame	33	14.6
Paired Frames	24	10.6
Multiple Frames	77	34.1
Total	226	100.0

Note:  $n = 226$ 

Table 5

*Leadership Effectiveness Based on Number of Frames Used*

Number of Frames	Size ( $n$ )	Mean	Standard Deviation	95% Confidence Interval for Mean	
				Lower Bd.	Upper Bd.
No Frames	92	2.55	1.07	2.33	2.78
Single Frame	33	3.79	0.55	3.59	3.98
Paired Frames	24	4.42	0.65	4.14	4.69
Multiple Frames	77	4.61	0.49	4.50	4.72
Total	226	3.63	1.23	3.47	3.79

Note:  $n = 226$ 

Table 6

*Differences in Perceived Leadership Effectiveness Based on Number of Frames Utilized*

	Sum of Squares	df	Mean Square	$F$	$p$
Between Groups	196.13	3	65.38	101.93	.000*
Within Groups	142.39	222	0.64		
Total	338.52	225			

\*Significant at .05

Note:  $n = 226$

Table 7

*Tukey HSD for the Number of Frames Utilized Based on Perceived Leadership Effectiveness*

Number of Frames	N	Subset for alpha = 0.05		
		1	2	3
No Frames	92	2.55		
Single Frame	33		3.79	
Paired Frames	24			4.42
Multiple Frames	77			4.61

Note:  $n = 226$

To summarize, data from both Sections I and III of the LOI were used to determine if there were differences in the perceived leadership effectiveness based on the primary leadership frame used. The tests run showed no statistical significance in perceived leadership effectiveness based on primary leadership frame at the .05 level of significance.

Data from both Sections I and III were also used to determine if there were differences in the perceived leadership effectiveness based on the number of leadership frames utilized by aviation program leaders as stated by survey respondents. The tests run showed statistical significance within perceived leadership effectiveness based on the number of leadership frames at the .05 level of significance. A post-hoc (Tukey HSD) test was run to determine where the differences existed in the number of leadership frames used. There was no significant difference between the multiple and paired frames categories at the .05 level of significance. The perceived leadership effectiveness of the multiple frames, however, was significantly greater than the single and no frames groups. The mean for the paired frames group was significantly greater than the single, and no frames groups at the .05 level of significance. Lastly, the mean of the single frame group was significantly greater than the mean of the no frames group at the .05 level of significance.

### **Conclusion, Discussion, and Recommendations**

#### **Conclusions**

The following conclusions are drawn from the data analysis and findings of the study:

1. Most aviation faculty and staff feel their leaders are being effective in their leadership roles.
2. Primary leadership frame does not affect perceived leadership effectiveness.

3. Aviation program leaders who utilize two or more frames are perceived to be more effective leaders than those who use one or no leadership frames.

## **Discussion**

In order to determine if differences existed in perceived leadership effectiveness based on primary leadership frame and number of frames used, a baseline measurement of perceived leadership effectiveness was first measured. Most aviation program leaders were ranked by respondents in the highest two categories of aviation program leaders. This indicates that the majority of the respondents felt that their leaders were in the 61-100% leadership effectiveness groupings with less than half of aviation program leaders falling in the 0-60% leadership effectiveness groupings. Again, this may be explained by the difficult nature of aviation higher education. Effective leaders are needed to successfully deal with the unique challenges of the environment. It further follows that leaders who do not perform well may not be in leadership roles for extended periods of time or will have aviation programs that suffer and fail to continue.

With regard to the differences in perceived leadership effectiveness based on primary leadership frame, aviation program leaders did not receive higher leadership effectiveness scores based on their primary leadership frame. One possible reason for this could be the scoring method used. Again, for a leader to be counted as using a frame for research question two, they had to score a composite mean of 4.0 or higher for the given frame. Individuals below the cutoff were not counted. A 4.0 and higher score indicates strong leadership skills are present. Leaders may be stronger in one frame than others, but ultimately they still possess strong leadership abilities in at least one area (frame). Since they have strong foundational leadership skills, respondent followers may perceive them to be equally effective with regard to the success and happenings at their respective institutions. They may not be strong in the same frames, but to the respondent followers it does not matter to which frame they most strongly subscribe as long as they get the job done effectively. This finding may indicate that aviation program leaders who wish to be perceived as effective may not need to subscribe to one specific frame (symbolic for example), but must ensure that they are highly effective (4.0 or higher) in the leadership frame of their choosing.

Regarding the differences in perceived leadership effectiveness based on number of frames utilized, aviation program leaders score higher among respondents taking the survey in perceived leadership effectiveness if they subscribe to the paired frames or multiple frames approaches. Leaders who only utilize a single frame or no frames approach had lower perceived leadership effectiveness ratings. As previously mentioned, it is necessary for a leader in aviation higher education to accomplish a number of goals and objectives in a challenging environment. Bolman and Deal (2008) posited that is important for a leader to use all of the frames in differing combinations to be effective. The findings support this statement. The perceived effectiveness of a leader increased when paired or multiple frames were utilized. No significant difference was found between the effectiveness scores of leaders who utilize paired or multiple frames, but the effectiveness mean score increased as the number of frames used increased.

Furthermore, leaders who wish to be perceived as effective must subscribe to and utilize multiple frames.

### **Recommendations**

Aviation program leaders should subscribe to a paired or multiple frames approach. Leaders who did so in this study had higher perceived leadership effectiveness from followers. Aviation program leaders should make a point to implement more of Bolman and Deal's frames into their leadership practices to better lead in differing situations.

One possible way to improve survey response rate would be to offer a small incentive for survey participation. SurveyMonkey® offers some options to include as incentives such as coupons, instant win games, and sweepstakes. The possibility of a small reward could improve the response rate for future studies.

Aviation program leaders should study Bolman and Deal's leadership theory and understand the importance and role of each frame. Doing so will enable a leader to implement an appropriate frame to lead more effectively.

The current study only utilized the LOI-Other in order to prevent the loss of much needed samples. For future study, the implementation of the LOI-Self along with the LOI-Other is recommended to compare the self-perceptions of aviation program leaders to those of their followers. Doing so will provide a more in-depth picture of the leadership phenomenon in aviation higher education. Taking these actions would more closely mirror the studies of others who have used Bolman and Deal's frame theory (Beck-Frazier, 2005; Burks, 1992; Goldsmith, 2005; Tedesco, 2004).

Lastly, this study only posed one question pertaining to leadership effectiveness. Further study may be accomplished to measure leadership effectiveness more deeply and accurately as it relates to four frame leadership theory.



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