

# Gaining Perspective of an Industry's Readiness for Regulatory Change: A Case Study From the Aviation Industry

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## Abstract

A change in regulatory policy regularly affects more than one organization and may involve an entire industry comprised of thousands of diverse organizations. These types of regulatory changes often encounter significant resistance from industry stakeholders as they often view new regulation with a certain level of skepticism, contributing to policy gridlock. A significant factor in whether any change initiative fails or succeeds is the organization's readiness for change. However, a preponderance of the organizational change research to date has focused on individuals, targeted small groups, or single organizations – little has focused on regulatory policy changes that may affect a very large and diverse industry group. By better understanding an industry's readiness for change, regulators may more effectively identify and understand the potential opposing forces, develop strategies to overcome these forces, and therefore may create a change vector. Recently, the Federal Aviation Administration proposed a major regulatory change affecting the United States' aviation repair station industry. This heavily debated regulation would require industry organizations to develop a formal Safety Management Systems. Thus far the regulation has met stiff industry resistance. This research attempted to gain perspective of the industry's readiness for change and found their overall readiness level was low. Although this research was limited in scope and intended as an initial exploration of change readiness concepts across a large industry faced with a proposed major public policy shift, the results suggest readiness for change assessments may assist public agencies with managing major regulatory change.

**Keywords:** aviation safety, organizational change, public policy, readiness for change, safety

## 1. Introduction

The increasing acceleration of technological innovation, changing government regulations, political events, and a dynamic economic environment are major catalysts that require ongoing and often major organizational change (Pfeffer, 1994; Fuiyoaga, 2012). Cummings and Worley (2014) describe change efforts as moving the organization in a particular direction-- from a current state to a desired state. However, defining what is the "desired state" is often a point of contention among organizational stakeholders, which is often the case with many proposed regulations or policies Cummings et al (2014). Holt, Armenakis, Feild and Harris (2007) describe three stages of successful change implementation: 1) readiness to change, 2) adoption, and 3) institutionalization. Arguably, the first step, readiness to change, may be the most important (Armenakis, Harris, and Mossholder, 1993; Fuiyoaga, 2012). Understanding an organization's readiness to change can help guide organizational leaders or regulators as they approach change and identify the optimum change strategies (Armenakis, Harris, 2009).

This research discusses a case study from the domestic aviation repair station industry and the industry's readiness for a proposed regulatory change – Safety Management Systems (SMS). Coupled with aviation's increasing technological complexity, growth in general and commercial aviation air traffic, and changes in the composition of the air transport fleet, the FAA's workload focus needs to shift given its limited resources (AIN, 2012; Boeing, 2011; FAA, 2011). Thus, the FAA is shifting away from a traditional enforcement model of safety oversight to a partnership model that promotes safety through self-responsibility at the industry level (AIN, 2012; Gilligan, 2016). SMS is a fundamental component of this regulatory shift (AIN, 2012; Gilligan, 2016; Lercel, 2013). SMS promotes safety through self-responsibility at the industry level and is considered a comprehensive approach to managing risk in aviation and other high-consequence industries (FAA, 2018). The proposed SMS regulation has met stiff resistance from the repair station industry; predominately because many perceive the regulation to be of no benefit

and overly burdensome (AEA, 2009; AOPA, 2009; FR, 2010; SBA, 2009). The focus of this research is not to support or debate a specific regulatory position but rather gain insight into how readiness for change may affect the proposed or desired altered state. The repair station industry's readiness for change may be low, which may be a significant contributing factor to their negative perception of this proposed policy. Holt, et al. (2007) argue the first step in a successful change initiative is creating a readiness for change; while Pond, Armenakis, and Green, (1984) and Fox, Ellison, and Keith (1988) suggest that assessing an organizations readiness for change may help change agents gauge the state of readiness and better develop effective change strategies.

## 2. Theoretical Framework

The struggle of organizational change may be exemplified by Lewin's (1951) *Force-Field Analysis Model* (Figure 1), which describes change as a battle between two opposing forces - the forces for change (positive) and the forces against change (negative). The forces for change push the organization towards the desired state, while the forces against change resist any movement and attempt to maintain the status quo. Lewin (1951) describes these forces as not only having direction (positive or negative), but also as having varying levels of magnitude.

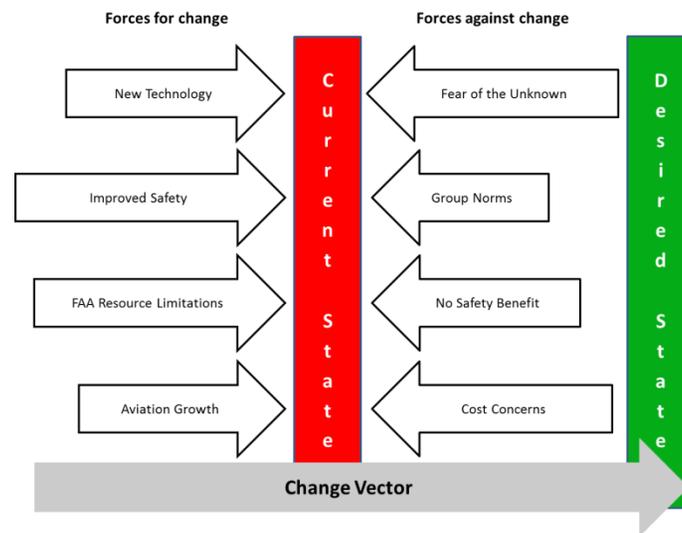


Figure 1. Force-field analysis model, adapted from Cummings and Worley (2014)

Drawing upon the science of physics, a force is defined as a vector quantity, having both magnitude and direction (Lindenfeld, White Brahmia, 2011). Referring to Figure 1, Lewin's (1951) model indicates that for an organization to move from the current state to the desired state, an unbalanced condition must exist where the forces for change are greater than the forces against change. In other words, for change to occur the sum of all forces must be positive, resulting in an overall vector moving the organization towards the desired state. Therefore, Lewin's model suggests that this vector, as illustrated in Figure 2, may be defined as a "change vector."

A common and often powerful negative force working against a change vector is stakeholder resistance (Erwin & Garman, 2010; Maurer, 1996). Armenakis, Harris, and Mossholder (1993) suggest that by creating a readiness for change, organizations may reduce the stakeholder's resistance and may increase their support for the change; thus, implying that readiness for change may contribute to organizations achieving a change vector. Readiness for change relates to resistance to change, but the two are distinctly different (Armenakis et al., 1993). Readiness for change is the "cognitive precursor to the behaviors of either resistance to, or support for, a change effort" (Armenakis et al., 1993, pp. 681-682). Backer (1995, pp. 22) describes readiness for change as "...people's beliefs, attitudes, and intentions regarding the extent to which changes are needed and their perception of individual and organizational capacity to successfully make those changes." Successful change initiatives are dependent upon an appropriate level of readiness--one of the most important factors in gaining initial support (Armenakis et al., 1993; Armenakis, Harris, & Feild, 1999).

A review of the literature found little evidence regarding research in the area of public policy initiatives that may affect change across an industry community comprised of thousands of organizations. A literature search using the terms "organizational change", "readiness for change", and "regulation" or "regulatory" resulted in 1,841 peers – reviewed

journal articles. To keep the review manageable, the search was limited to articles published between June 2005 and June 2018. Articles in non-English or related to biological, political, social, or environmental change were discarded. A review by title of the newest 250 and the oldest 250 articles found 54 article titles that suggested they may relate to readiness for public policy or regulatory change. However, reviewing these articles found none were directly related to assessing an industry's readiness for policy change. These findings are supported by Weiner (2009) and Weiner, Amick, and Lee (2008) who also found a preponderance of the research focused on individuals, targeted small groups, or single organizations, with no mention of organizational change driven by new public policy. Most research regarding organizational change and resistance to change typically focus on characteristics associated with individuals within an organization (Jones, Renae A.; Jimmieson, Nerina L.; Griffiths, Andrew, 2005). Bouckennooghe (2010) found that change readiness theory and measurement overwhelmingly focus on the individual level but researchers often apply these findings incorrectly to an organization's readiness for change. However, from the literature one can infer that readiness for change is as important to a major public policy change as it is to a smaller scale change initiative at the individual or organizational level. Gaining perspective of an industry's readiness for change may provide regulators valuable empirical data that may assist them in deciding whether to move forward with the proposed policy, modify the policy, or develop an alternative strategy to improve the industry's readiness for change - helping to create a change vector.

Neves (2009) presents three dimensions of readiness for change: self-efficacy, change appropriateness, and personal valence; while Cunningham, Woodward, and Shannon (2002) found that employees with higher job-change self-efficacy reported higher readiness for change and contributed more to the change intervention. Determinants of change efficacy include familiarity and organizational support. Efficacy is expected to be high when familiarity with the change is high and they perceive the organization will provide them the resources and support to succeed (Shea, Jacobs, Esserman, Bruce, & Weiner, 2014). Ironically, the FAA SMS Aviation Rulemaking Committee (ARC) suggested that a low level of familiarity among stakeholders maybe a contributing factor to the industry's resistance to SMS, (FAA 2010) stating:

"...the team recognized that smaller organizations currently have less of an understanding of SMS and their responses may reflect fears of the unknown", and goes on to say, "it appears concerns and issues may be due to a lack of or misunderstanding of SMS. Comments [submitted] generally appear to be looking negatively on SMS without knowing all there is needed to know."

The literature confirmed that many repair station representatives, especially small organizations, were resistant to SMS compliance, with many strongly opposed to any such requirement (Lercel, Patankar, 2011). Many in the repair station industry and the FAA consider SMS a major change or shift in how the industry and FAA will manage safety in the future (Lercel, 2013), which Burke (2004) suggests organizations and individuals are especially resistant to this type of change.

Armenakis et al. (1993) and Neves (2009) suggest that readiness for change is contingent upon organizational stakeholder's level of familiarity with the proposed change, agreement that the change is appropriate, and their level of efficacy and valence. Shea, et al. (2014), Neves (2009), Madsen, Miller, & Cameron (2005) suggest that familiarity has a significant effect on appropriateness, efficacy, and valence. This suggests that an appropriate level of familiarity with SMS across the repair station industry is a significant factor in achieving policy adoption.

Familiarity with the proposed change is one factor that must be relatively high among members in order to achieve overall support (Cummings, et al., 2014; Armenakis, Harris, 2009). In order for regulators to create a change vector towards policy adoption, a majority of the stakeholders must first have a high level of familiarity with the policy. If familiarity with the proposed policy is low, the literature suggests that the natural tendency will be to resist or disagree (Cummings, et al., 2014). Second, a majority of stakeholders familiar with the policy must also have a high level of agreement that the policy is appropriate and provides positive valence and efficacy (Armenakis, et al, 2009; Neves, 2009). If stakeholders with a high level of familiarity also have a high level of agreement with appropriateness, efficacy, and valence, then regulators are more likely to create a change vector through strategies aimed at ensuring a majority of the population have a high level of familiarity with the policy.

Readiness may be assessed using survey research methodologies, which includes questionnaires, interviews, and observations (Pond, Armenakis, and Green, 1984; Fox, et al., 1988). Although qualitative methods provide a greater depth of information, quantitative methods offer change agents and researchers an efficient means to gather information across a large and dispersed population in a relatively short time (Isabella, 1990). However, the current survey instruments are lengthy and not practical for use in busy organizational or industry settings (Holt, et al., 2007). In addition, Weiner, et al (2008) found ambiguity and disagreement regarding readiness for change concepts;

furthermore, they found limited evidence of reliability or validity for most measures of change readiness. This research focused on gaining perspective of industry's readiness for policy change along with identifying potential strategies for overcoming the current policy gridlock and not testing a particular hypothesis or determining causation. In addition, this research involved surveying a large population of very busy aviation executives; therefore, researchers developed an abbreviated survey instrument based on the research of Armenakis (2011) and Neves (2009) with the hopes of achieving a relatively high response rate.

### 3. Methodology

This study attempted to gain perspective of the repair station industry's readiness for SMS policy adoption by evaluating the organization's designated FAA accountable manager's familiarity with SMS (Familiarity), perceived level of SMS appropriateness (Appropriateness), level of efficacy or adaptability (Efficacy), and the safety benefits of SMS (Valence). The FAA defines accountable manager (FAA, 2017) as, "the person designated by the certificated repair station (CRS) who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the Federal Aviation Administration (FAA)."

This research recruited participants by utilizing publicly available information obtained from the FAA's repair station and air agency database, which provides detailed information regarding all FAA certificated repair stations. This information includes the organization's name, address, number of employees, repair station ratings, and the name and email address of the repair station's accountable manager. The researcher emailed a web-based online survey instrument to the population of 4277 (N = 4277) accountable managers using the Qualtrics Online Survey Software.

Table 1. Sample survey questions

Area of Measure	Survey Questions	Variable Name	Measure
<b>Familiarity</b>	To what extent are you familiar with Safety Management Systems?	SMS Familiarity	Likert
<b>Familiarity</b>	To what extent are you familiar with the proposed SMS regulation?	SMS Rule Familiarity	Likert
<b>Valence</b>	SMS improves the safety of my organization.	Safety Performance	Likert
<b>Valence</b>	SMS will reduce maintenance errors in my organization	SMS Reduces Errors	Likert
<b>Appropriateness</b>	There are legitimate reasons why the repair station industry needs to implement an SMS.	SMS Legitimacy	Likert
<b>Appropriateness</b>	Repair stations should have an SMS.	SMS Appropriateness	Likert
<b>Efficacy</b>	My organization's senior leaders have encouraged all of us to embrace SMS.	Leadership Support	Likert
<b>Efficacy</b>	I do not anticipate any problems adjusting to the work I will have if SMS is adopted.	Adjusting to SMS	Likert

Table 1 provides a list of the survey questions used to assess the participants' readiness for change and measured their attitudes and opinions using a five point Likert - type scale (Table 2). A sample size estimate was based on a confidence level of 95% and a confidence interval of 5%. The researcher determined a sample size of approximately 350 cases would be adequate based on calculations and confirmation in the literature (Krejcie, & Morgan, 1970). Overall, researchers retained 439 (n = 439) usable cases and the average completion rate of each survey was 98.7%. SPSS software was used to conduct statistical correlation and analysis of variance (ANOVA) tests in order to compare the relationships between variables.

Table 2. Likert-type scale

Scale	Level of Agreement	Level of Familiarity
1	Strongly Disagree	Not at all
2	Disagree	To a Little Extent
3	Neither Agree nor Disagree	To Some Extent
4	Agree	To a Moderate Extent
5	Strongly Agree	To a Large Extent

#### 4. Results

All respondents either were owners of, or employed by, a part 145 repair station with the following job position breakdown: 32% manager, 18% vice president or general manager, 16% director, 14% owner, 9% chief executive officer or president, and 11% other.

Table 3. Respondent's organizational size vs. domestic repair station population

Organizational Size	Number of Employees in the Organization	Number of Respondents n = 439	Sample Percentage	Population Percentage
Very Small	1 – 10	136	31%	47%
Small	11 – 25	80	18%	18%
Medium	26 – 50	58	13%	12%
Large	51 – 100	55	13%	8%
Very Large	greater than 100	110	25%	15%

Table 3 provides a breakdown of respondents by organizational size, illustrating the largest number of respondents (31%) were from organizations categorized as Very Small (1-10 employees). The sample distribution across the five categories of Organizational Size was not representative of the population distribution; however, the sample size for each category was sufficient to allow for correlation tests and mean comparisons.

Table 4. Correlation table

Variable	M	SD	1	2	3	4	5	6	7	8
1. Organizational Size	----	----	----							
2. SMS Familiarity	3.28	1.23	.420**							
3. SMS Rule Familiarity	2.86	1.22	.382**	.763**						
4. Safety Performance	3.29	1.24	.358**	.502**	.366**					
5. SMS Reduces Errors	3.22	1.23	.370**	.458**	.353**	.843**				
6. SMS Legitimacy	3.21	1.18	.351**	.452**	.350**	.789**	.792**			
7. SMS Appropriateness	3.30	1.25	.357**	.485**	.373**	.859**	.911**	.811**		
8. Leadership Support	2.95	1.19	.371**	.537**	.425**	.704**	.695**	.636**	.686**	.
9. Adjusting to SMS	2.90	1.25	.312**	.452**	.352**	.727**	.729**	.722**	.716**	.687**

\*\*Correlation is significant at the 0.01 level (2-tailed).

Spearman Rho correlations were performed comparing the variables and resulted in all correlations being significant (Table 4). ANOVA tests compared group differences across the areas of familiarity, appropriateness, efficacy, and valence. This discussion will focus on the more significant correlations. It should be noted that high correlations suggest an association, but do not represent causality.

#### 4.1 SMS Familiarity

Overall, the industry's level of familiarity with SMS was low, with only 30.5% of organizations having had some type of SMS training. Only 12.5% of repair stations have an operational SMS, and 51.5% have not started any SMS development or implementation activities. The mean score of the industry's level of SMS Familiarity is 3.28 ( $M = 3.28, SD = 1.23$ ), which equates closely to a response of "to some extent", while SMS Rule Familiarity is lower with a mean score of 2.86 ( $M = 2.86, SD = 1.22$ ). Correlation results indicate that larger organizations tend to be more familiar with SMS.

#### 4.2 SMS Appropriateness

When participants were asked if they believe there are legitimate reasons why the repair station industry needs to implement SMS (SMS Legitimacy) the responses resulted in an overall mean score of 3.21 ( $M = 3.21, SD = 1.18$ ), which closely equates to a response of "neither agree nor disagree." Overall, 45.9% of respondents either agreed or strongly agreed, 25.5% either disagreed or strongly disagreed, and 28.6% neither agreed nor disagreed. When asked if repair stations should have an SMS (SMS Appropriateness), 46.8% of respondents either agreed or strongly agreed, 31.9% either disagreed or strongly disagreed, and 21.3% neither agreed nor disagreed.

There was a significant correlation between Organizational Size and the response to the questions of SMS Legitimacy and SMS Appropriateness (Table 4), indicating that as Organizational Size increased the level of agreement with SMS Legitimacy and SMS Appropriateness increased significantly (Figure 3). In addition, there was a significant correlation between SMS Legitimacy and SMS Appropriateness.

#### 4.3 Efficacy

Participants were asked if they anticipate any problems adjusting to the work they will have if SMS is adopted (Adjusting to SMS), which resulted in a mean score of 2.90 or "neither agree nor disagree" ( $M = 2.90, SD = 1.25$ ). Overall 37.6% of participants either disagreed or strongly disagreed, while 38.2% either agreed or strongly agreed, 24.2% neither agreed nor disagreed. Regarding Leadership Support, the mean score was 2.95 ( $M = 2.95, SD = 1.19$ ); 31.9% either agreed or strongly agreed, 36.3% neither agreed nor disagreed, and 31.8% disagreed or strongly disagreed with their organization's level of SMS support.

There was a significant correlation between Adjusting to SMS and Organizational Size ( $r = .312, p < .01$ ), which indicates that as Organizational Size increases then participants are in greater agreement that they can adapt to SMS. There was a significant correlation between Organizational Size and Leadership Support ( $r = .371, p < .01$ ), which indicates that as Organizational Size increases the level of Leadership Support increases.

#### 4.4 Valence

Overall survey results found that participants neither agreed nor disagreed that SMS improves the safety of their organization (Safety Performance;  $M = 3.29, SD = 1.24$ ); 48.5% either agreed or strongly agreed, 23.2% either disagreed or strongly disagreed, and 28.3% neither agreed nor disagreed. When asked if SMS helps repair stations reduce maintenance errors (SMS Reduces Errors;  $M = 3.22, SD = 1.23$ ) 46.3% either agreed or strongly agreed, 25.4% either disagreed or strongly disagreed, and 28.3% neither agreed nor disagreed.

There were significant correlations between Organizational Size and Safety Performance ( $r = .358, p < .01$ ) and SMS Reduces Errors ( $r = .370, p < .01$ ), which indicates that as organizational size increases so does the level of agreement that SMS improves safety performance and reduces maintenance errors.

#### 4.5 Correlating SMS Familiarity With SMS Appropriateness, Efficacy, and Valence

##### 4.5.1 SMS Familiarity: SMS Appropriateness

Two-way independent ANOVA tests of the main effect of SMS Familiarity on SMS Legitimacy were significant,  $F(4, 405) = 12.066, p < .01, \eta^2 = .106$ , indicating that as SMS Familiarity increased then the opinion that there are legitimate reasons for SMS increased. Post hoc tests found respondents familiar with SMS to a "large extent" ( $M = 4.06, SD = .92$ ), to a "moderate extent" ( $M = 3.46, SD = 1.07$ ), to "some extent" ( $M = 2.96, SD = 1.10$ ) agree significantly ( $p < .01$ ) more than respondents "not at all" familiar ( $M = 2.43, SD = 1.09$ ) that there are legitimate reasons for repair stations to implement SMS. The main effect of Organizational Size on SMS Legitimacy was also

significant,  $F(4, 405) = 4.663, p < .01, \eta^2 = .044$ . However, the interaction between SMS Familiarity and Organizational Size was not significant ( $p = .559$ ), indicating that the effect of SMS Familiarity on SMS Legitimacy was not dependent on Organizational Size.

Two-way independent ANOVA tests of the main effect of SMS Familiarity on SMS Appropriateness were significant,  $F(4, 409) = 15.976, p < .01, \eta^2 = .135$ , indicating that as SMS Familiarity increased then the level of agreement with SMS Appropriateness increased. Tukey post hoc tests found respondents familiar with SMS to a “large extent” ( $M = 4.24, SD = .98$ ), to a “moderate extent” ( $M = 3.63, SD = 1.02$ ), and to “some extent” ( $M = 3.01, SD = 1.14$ ) agree significantly ( $p < .01$ ) more than respondents “not at all” familiar ( $M = 2.44, SD = 1.02$ ) that SMS is appropriate for repair stations. Those familiar with SMS to a “large extent” and to a “moderate extent” also agree significantly ( $p < .01$ ) more than those familiar to “some extent” and a “little extent” ( $M = 2.89, SD = 1.21$ ) that SMS is appropriate, while to a “large extent” also agrees significantly ( $p < .01$ ) more than “moderate extent.”

The main effect of Organizational Size on SMS Appropriateness was also significant,  $F(4, 409) = 5.815, p < .01, \eta^2 = .054$ . However, the interaction between SMS Familiarity and Organizational Size was not significant ( $p = .432$ ), indicating that the effect of SMS Familiarity on SMS Appropriateness was not dependent on Organizational Size.

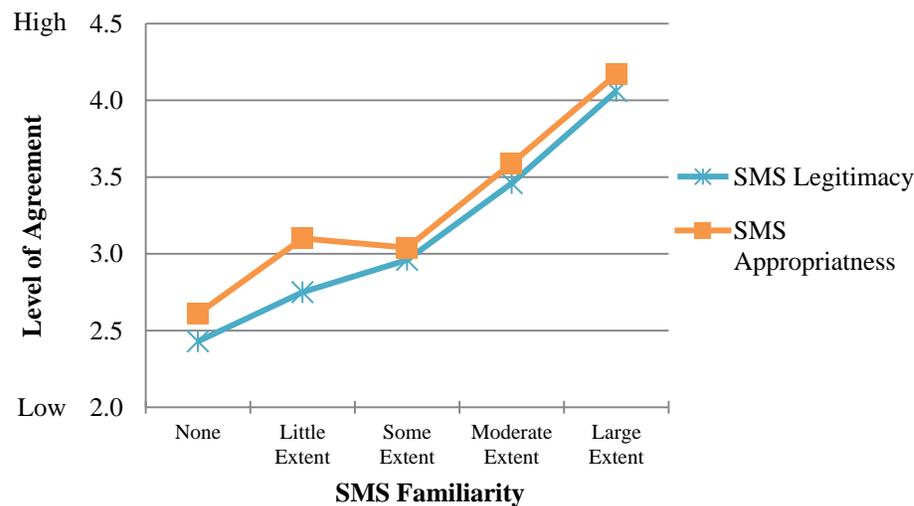


Figure 2. Comparison of level agreement with SMS legitimacy/appropriateness by organizational size

Figure 2 illustrates that as SMS Familiarity increased, the level of agreement with SMS Legitimacy and SMS Appropriateness increased across all categories of Organizational Size, with the overall mean scores illustrating an almost linear relationship.

#### 4.5.2 SMS Familiarity: SMS Efficacy

A two-way independent ANOVA found that SMS Familiarity,  $F(4,405) = 17.425, p < .01, \eta^2 = .147$ , and Organizational Size,  $F(4,405) = 2.791, p < .05, \eta^2 = .027$ , both had a significant main effect on Adjusting to SMS. Again, there was no significant ( $p = .493$ ) interaction between SMS Familiarity and Organizational Size, which indicates that the effect of SMS Familiarity on Adjusting to SMS was not dependent on Organizational Size.

Similarly, ANOVA results found significant main effects of SMS Familiarity,  $F(4, 405) = 24.880, p < .01, \eta^2 = .197$ , and Organizational Size,  $F(4, 405) = 3.367, p < .05, \eta^2 = .032$ , on Leadership Support. Also, there was no significant ( $p = .556$ ) interaction between SMS Familiarity and Organizational Size, which again indicates that the effect of SMS Familiarity on Leadership support was not dependent on Organizational Size. Figure 3 illustrates an almost linear relationship between Adjusting to SMS, Leadership Support, and SMS Familiarity; as the respondent’s familiarity with SMS increases then so does their level of efficacy.

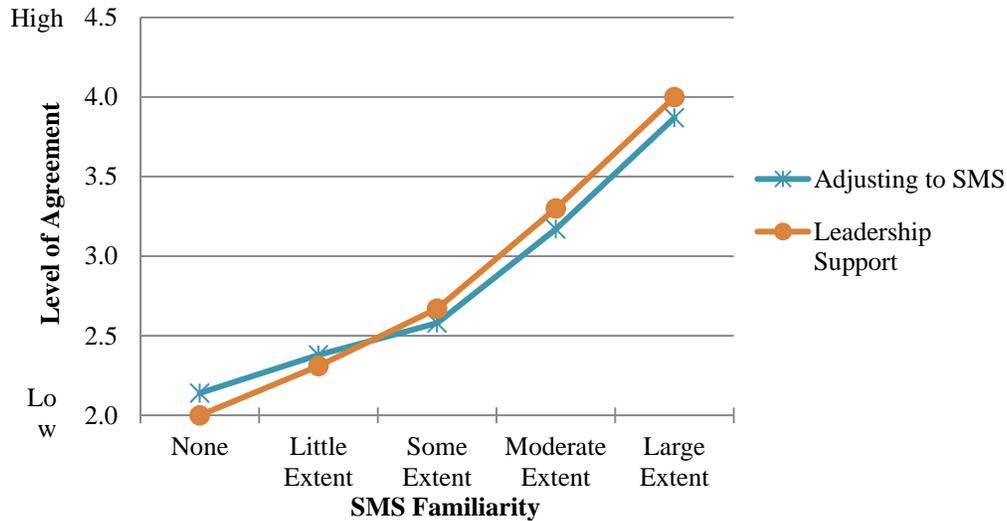


Figure 3. Effect of SMS familiarity on adjusting to SMS and leadership support

4.5.3 SMS Familiarity: Valence

A two-way independent ANOVA found that SMS Familiarity,  $F(4,409) = 16.996, p < .01, \eta^2 = .143$ , and Organizational Size,  $F(4,409) = 5.623, p < .01, \eta^2 = .052$ , both had a significant main effect on Safety Performance. However, there was no significant ( $p = .446$ ) interaction between SMS Familiarity and Organizational Size, which indicates that the effect of SMS Familiarity on Safety Performance was not dependent on Organizational Size.

ANOVA results found significant main effects of SMS Familiarity,  $F(4, 409) = 15.980, p < .01, \eta^2 = .118$ , and Organizational Size,  $F(4, 409) = 5.937, p < .01, \eta^2 = .055$ , on SMS Reduces Errors. Again, there was no significant ( $p = .637$ ) interaction between SMS Familiarity and Organizational Size, which indicates that the effect of SMS Familiarity on SMS Reduces Errors was not dependent on Organizational Size. Figure 4 illustrates an almost linear relationship between Adjusting to SMS, Leadership Support, and SMS Familiarity; as the respondent’s familiarity with SMS increases so does their level of valence.

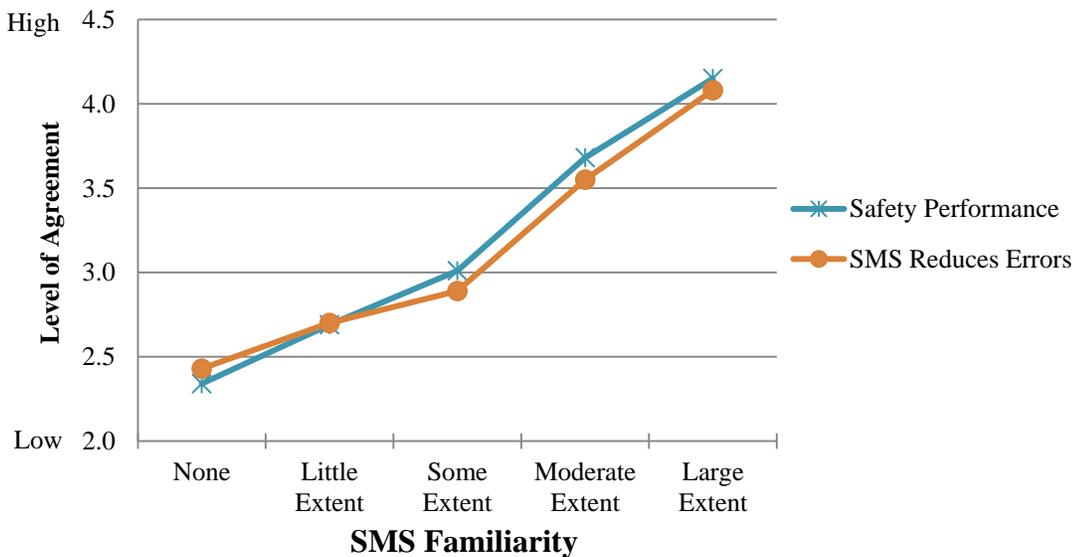


Figure 4. Effect of SMS familiarity on safety performance and SMS reduces errors

## 5. Discussion

The findings from this research support the past literature; suggesting that familiarity with a proposed change may significantly influence the stakeholder's opinion of appropriateness, efficacy, and valence (Shea, et al., 2014; Neves, 2009; Madsen, et al., 2005). Furthermore, this study indicates that the use of change readiness assessments in regulatory policy initiatives may help regulators to gain perspective on an industry's readiness for regulatory change and identify potential strategies for improving the level of readiness across a large industry group and creating an unbalanced sum of forces moving towards a change vector.

The research results suggest the repair station industry's overall level of SMS Familiarity and SMS Rule Familiarity is low, especially with the Very Small and Small organizations. Less than a third of all respondents indicated that their organization has had some type of SMS training and only 12.5% indicated that their organization has an operational SMS. In addition, the respondents' overall level of agreement with SMS Appropriateness, Valence, and Efficacy was low, with less than 50% indicating agreement.

However, as the respondents' level of Familiarity increased their level of agreement with Appropriateness, Efficacy, and Valence increased significantly; the effect of Familiarity was similar across all five categories of Organizational Size. Appropriateness, Efficacy, and Valence increased dramatically when the respondents' level of Familiarity rose above "some extent"; Figures 2-4 depict a point of inflection at the "some extent" level of Familiarity. Ultimately, respondents familiar with SMS to a "large extent" had Appropriateness, Efficacy, and Valence scores near or above "agree." These findings suggest that efforts aimed at increasing the industry's level of familiarity may assist regulators with improving the state of change readiness.

Approximately 70% of the repair station population is comprised of Very Small or Small organizations (Table 3); thus, significant support from these smaller organizations is required for SMS policy adoption. However, only 21.3% of the respondents from Very Small organizations and 38.8% of the respondents from Small organizations are at a Familiarity level above "some extent". In addition, only 13.3% of the respondents from Very Small organizations and 23.8% of the respondents from Small organizations are familiar with the proposed SMS rule above a level of "some extent." Thus, regulators may consider developing strategies focused on raising the level of Familiarity across these two groups.

## 6. Limitations and Future Research

This research found that the use of change readiness assessments may provide rich information that contributes to a body of discourse that may help address policy gridlock. However, change readiness studies in the area of regulatory change that may affect a large industry group are rare. In addition, there are few mature readiness assessment instruments. Compared to previous survey instruments, this research utilized a very brief instrument aimed at obtaining a high response rate across a population of busy business executives. Although this research was successful in achieving a high response rate, future research is required to develop a concise, reliable and valid survey instrument. One area that requires further investigation is the relational direction between the variables; for example, knowledge increases readiness requires further research to confirm and support the current research. Several unexplored factors require further exploration and were not accounted for in this research study but may have influenced the research participants' responses and contribute to the industry's policy resistance, such as media reports, opinions of industry leaders, perceived costs of compliance and need for regulation, apprehensive view of the FAA, or a general fear of the unknown.

Research limitations exist concerning possible differences across organizations and how they approach, communicate, and execute change. These differences can significantly affect the levels of familiarity, appropriateness, efficacy, and valence. This study could not control these differences. In addition, this survey asked individuals to measure their own levels of familiarity but did not test for a level of familiarity. This provided a somewhat subjective measurement of familiarity.

In addition, this study focused on readiness from an industry perspective and did not involve the FAA. FAA personnel would be the frontline regulators regarding SMS compliance, therefore, their opinions regarding this proposed SMS compliance solution are extremely valuable. In addition, by investigating the attitudes and opinions of the FAA inspectors regarding SMS, change agents can understand these forces and better develop effective SMS development and implementation strategies. Conducting research on FAA personnel is an important next step in advancing SMS adoption.

## 7. Conclusion

The literature prominently illustrates the importance of creating a state of readiness by building awareness of the proposed change and educating and training stakeholders; thereby, overcoming the natural resistance to change (Rowden, 2001; Armenakis, et al., 1993). Although this research was limited in scope and intended as an initial exploration of change readiness concepts across a large industry faced with a proposed major public policy shift, the results suggest readiness for change assessments may assist public agencies with managing major regulatory change. These assessments may provide both regulatory agencies and change agents valuable insight into the basis of stakeholder resistance. Furthermore, by gaining perspective on the affect change readiness may have on stakeholder resistance, regulators may better focus change efforts and improve the efficiency of the change process. While this study found the repair station's readiness for change was relatively low, the data suggest that efforts aimed at improving the stakeholder's knowledge of SMS may improve their overall level of readiness – contributing to the forces for change needed to create a change vector.

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