AUTHENTIC LEADERSHIP & SAFETY CLIMATE

Leading Teams to a Safer Workplace

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RESEARCH HAS SHOWN THAT organizational leadership affects safety climate, safety culture and safety outcomes (Cooper & Phillips, 2004; Dirik & Intepeler, 2017; Gerganoff, 2019; Leemann, 2002). However, there is limited data that can be used to examine the relationship between authentic leadership and occupational safety climate, which the authors believed would exist. The findings of the present study support this hypothesis and provide safety professionals and organizational decision-makers support to invest resources into leadership development programs. To better understand these concepts, the authors provide an overview of literature that examines safety climate (Denison, 1996; Kines et al., 2011) and authentic leadership (Bass, 2008; Kuchinka, 2020). The authors then discuss the present study and what was learned, the conclusions drawn and recommendations for safety practitioners.

Literature Review: Safety Climate & Authentic Leadership

Safety climate is defined by Cooper and Phillips (2004) as a priority for safety within an organization at a specific point in time, including the identification of possible safety failures. Kines et al. (2011) define safety climate as "shared perceptions among the members of a social unit, of policies, procedures and practices related to safety in the organization" (p. 635). Denison (1996) notes that safety climate and safety culture differ. Zohar (1980) distinguishes safety climate and culture as workers' perceptions of safety priorities at a given time (climate) or over time (culture). Leaders who are supervisors may not have the opportunity to contribute to the policy, mission and overall company objectives, which are more consistent with the culture. However, supervisors have daily opportunities to contribute as leaders to the climate in the organization, especially among followers who are often their direct reports. For this reason, this study examined safety climate with a focus on authentic leadership, which is often associated with a positive relationship between leaders and followers. By measuring an organization's safety climate, the organization can have a better perspective on where to make improvements to cultivate an improved safety culture.

KEY TAKEAWAYS

- **This article discusses safety climate including relevant research that provides scholarly as well as practical implications.**
- **Authentic leadership is also discussed, including safety-related challenges and solutions and the impact on safety climate.**
- **The authors discuss how this research reveals a strong relationship between safety climate and authentic leadership behaviors.**

The concept of leadership is far more complex than many believe it to be. Bass (2008) demonstrates how leadership can be explained in a vast array of ways. Authentic leadership is just one of the countless models that have been created to help us better understand the concept of leadership. Other popular models include transformational leadership and servant leadership. According to Barling et al. (2002), transformational leadership includes idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. In that two-part study, Barling et al. found an indirect association between transformational leadership and occupational safety. First, safety-specific transformational leadership behaviors, safety climate and safety-related events such as near-miss events were examined. The results showed that safety climate significantly affected safety events or events that were sometimes viewed as accidental. The second part of the study revealed that transformational leadership characteristics were predictors of safety climate constructs, which were predictors of safety events. Jule (2020) found that when employee injuries occurred, leader commitment was needed to improve safe behaviors of the employees. Merrill (2015) found that the transformational leadership style of the nurse manager impacted patient safety. Although a transformational leadership style can be highly effective, servant leadership behaviors are still necessary for leaders to excel.

Servant leadership is a model that emphasizes the importance of core values and behaviors such as caring, honesty, spirituality, compassion, trust and authenticity. The authors argue that as a component of servant leadership, authentic leadership is part of the foundation of the behaviors needed to be an effective leader (Kuchinka, 2020). Research from Sendjaya and Pekerti (2010) demonstrates that servant leadership is a significant predictor of followers' trust in their direct leader. The authors of that study suggest that behaviors to build trust include role modeling and showing concern for followers. Trust was found to be an important leadership trait, and trust is established by being authentic as a leader. Kath et al. (2010) found that trust mediated a correlation between safety climate and organizational outcomes. Their research indicates that the ability to increase trust levels could increase worker motivation and the desire to work safely. Yasir et al. (2016) define transactional leadership as a leadership style whereby organizational goals are accomplished through promised rewards such as job promotions or pay increases. That study showed that both transformational leadership and transactional leadership had a positive relationship with employees' trust, although transactional leadership has other challenges that may offset the gains made through trust (Yasir et al., 2016). Engelbrecht et al. (2015) found a positive correlation between ethical leadership and trust in the leader, thereby indicating that employee trust in organizational leaders may increase when organizational leaders demonstrate ethical behaviors. They recommend interventions to build trust in the organization such as role modeling, auditing and appropriate supportive performance criteria rewards. Like servant leadership, transformational leadership and ethical leadership, Al-Moamary et al. (2016) describe authentic leadership as a form of leadership that inspires followers to achieve at higher levels.

Considerable research has explored authentic leadership and workplace-related outcomes. Edú-Valsania et al. (2016) found a correlation between authentic leadership and employee knowledge sharing. Scheepers and Elstob (2016) studied the correlation between authentic leadership and work engagement and found a positive impact on followers. Rana et al. (2022) took a different approach by investigating the correlation between abusive supervision and authentic leadership. They found a negative correlation, with lower levels of authentic leadership associated with higher levels of abusiveness in the supervisor relationship. In a sample of the South African construction industry, Skeepers and Mbohwa (2015) found that leadership behavior has a direct impact on safety performance, which, like other investigations, supports the present study.

In the present study, the authors examine authentic leadership based on the definition created by Avolio and Gardner (2005). The authors describe authentic leadership as the impression given that the leader is authentic in their behaviors. Avolio and Gardner define authentic leadership using four factors: self-awareness, balanced processing, relational transparency and internalized moral perspective. These factors are discussed next as the authors explain the research methodology.

Research Methodology

A quantitative correlational design explored the relationship between perceived authentic leadership behavior and occupational safety climate. A survey was created using the Authentic Leadership Questionnaire (Avolio et al., 2007) and the Nordic Safety Climate Questionnaire (NOSACQ-50; Kines et al., 2011). A sample was obtained from a compressed gas distribution company. It was hypothesized that there would be a positive relationship between occupational safety climate and authentic leadership. The seven dimensions of safety climate are:

1. management safety priority, commitment and competence
2. management safety empowerment
3. management safety justice
4. worker safety commitment
5. worker safety priority and risk nonacceptance
6. peer safety communication, learning and trust in peer safety competence
7. worker trust in efficacy of safety systems

Authentic leadership included the following four components:

1. self-awareness
2. balanced processing
3. relational transparency
4. internalized moral perspective

The hypothesis was established based on the premise that employees who perceived their leaders as more authentic will exhibit increased trust, communication about occupational safety and decreased participation in risky behaviors.

TABLE 1
SAFETY CLIMATE & AUTHENTIC LEADERSHIP FACTORS, SAMPLE ITEMS

Nordic Safety Climate Questionnaire (Kines et al., 2011)	
Management safety priority and ability	• Management ensures that everyone receives the necessary information about safety. • Management places safety before production.
Management safety empowerment	• Management makes sure everyone can influence safety in their work. • Management involves employees in safety decisions.
Management safety justice	• Management listens to all who have been involved in an incident. • Management treats employee involved in an incident fairly.
Workers' safety commitment	• We who work here try hard together to achieve a high level of safety. • We who work here help each other to work safely.
Workers' safety priority and risk nonacceptance	• We who work here regard risks as unavoidable (reverse score). • We who work here never accept risk-taking even if the work schedule is tight.
Peer safety communication, learning and trust in safety ability	• We who work here try to find a solution if someone points out a safety problem. • We who work here feel safe when working together.
Workers' trust in efficacy of safety systems	• We who work here consider that safety training is good for preventing incidents. • We who work here consider that it is important that there are clear-cut goals for safety.
Authentic Leadership Questionnaire (Avolio et al., 2007)	
Self-awareness	My leader seeks feedback to improve interactions with others.
Balanced processing	My leader solicits views that challenge their deeply held positions.
Relational transparency	My leader says exactly what they mean.
Internalized moral perspective	My leader demonstrates beliefs that are consistent with actions.

Survey Development

Participants were asked to rate the frequency of their direct supervisor's leadership behaviors on a five-point Likert scale, where 1 = not at all; 2 = once in a while; 3 = sometimes; 4 = fairly often; and 5 = frequent if not always. A higher order (composite) score was also calculated using an average of all four components. The NOSACQ-50 utilized a four-point Likert scale: 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree. Table 1 is a summary of each factor that was explored and example items. Practitioners who understand how each factor is defined will be better prepared to help develop the leadership behaviors of team members and create goals needed to achieve an effective safety climate.

All items included a not applicable (NA) option necessary to address scale bias. Participants were also asked their age, years employed in the compressed gas industry and work area location (West, Central, South, East, West Pennsylvania). The area data provided insight into potential challenges and strengths at a given location and was used internally for future employee or management leadership and safety climate development.

Population & Sampling

Participants for the present study were recruited from a company with locations in the Midwest region (Indiana, Michigan, Ohio and western Pennsylvania) of the U.S. The company fills, sells, and delivers compressed gasses and safety products. Participants included delivery truck drivers, salespeople, managers, retail store workers, and employees who fill compressed gas cylinders and load trucks. Employees regularly handled hazardous oxygen containers that could weigh as much as 570 lb. Employees were asked to participate in an anonymous survey during safety meetings by phone and email. Donuts during the safety meetings were the only incentive for completing the survey. Both online and print versions of the survey were available to accommodate participants.

Data were carefully screened and cleaned. Incomplete surveys were removed from the sample. A stem and leaf plot and a box plot were used to detect and examine outliers. Ten outliers were examined, determined to be reliable data and included in the final sample. The same process was applied to the authentic leadership scores and no outliers were removed. Items that had reverse scores were reverse-coded. Finally, all factor scores were calculated, and final preparations were made to move the reliable sample (N = 153) data to SPSS statistical software.

Participant Demographic & Frequency Data

The participants' ages ranged from 25 to 62, with an average age of 43. The average age at each location ranged from 41 to 47.

TABLE 2

SAMPLE DATA SUMMARY

Work area	*N*	Age range (average)	Years' experience range (average)	Authentic leadership average scores					Safety climate average scores
				Self-awareness	Balanced processing	Relational transparency	Internalized moral perspective	Overall composite score	
West	24	31 to 62 (46)	2 to 25 (14)	2.19	2.07	2.07	2.02	2.09	2.23
Central	34	27 to 56 (44)	0 to 21 (9)	2.73	2.65	2.73	2.67	2.70	2.36
South	48	26 to 60 (42)	1 to 33 (9)	2.36	2.37	2.37	2.36	2.37	2.23
East	31	25 to 60 (41)	0 to 33 (8)	2.62	2.51	2.72	2.69	2.65	2.31
West PA	16	38 to 54 (47)	2 to 19 (10)	1.70	1.65	1.41	1.70	1.60	1.93

Note. 0 = less than 1 year of experience.

Years of experience in the compressed gas industry ranged from < 1 year to 33 years, with an average of 10 years of experience. Years of experience at each location averaged 8 to 14 years. A representative sample was acquired from each geographic work area including West (n = 24), Central (n = 34), South (n = 48), East (n = 31) and West PA (n = 16). Table 2 is a summary of the descriptive data, as well as average levels of authentic leadership and safety climate.

The summary data in Table 2 reveals similar average age and years of experience by work area location, yet there is a noticeable difference in levels of authentic leadership and safety climate at the Central and West PA locations.

Results

Analysis of variance (ANOVA) statistical test was used to investigate the differences between authentic leadership (AL) levels and safety climate (SC) mean scores. After comparing differences based on locations, the results of an ANOVA test revealed several statistically significant differences between the average (mean) levels of AL and average levels of SC. The most noticeable were the significant differences between the Central and West PA work areas. West PA had the lowest scores for both AL and SC, while Central had the highest scores for both AL and SC. Figure 1 shows the progression from low to high AL and SC scores. These findings support the hypothesis that higher levels of AL behaviors contribute to an improved safety culture.

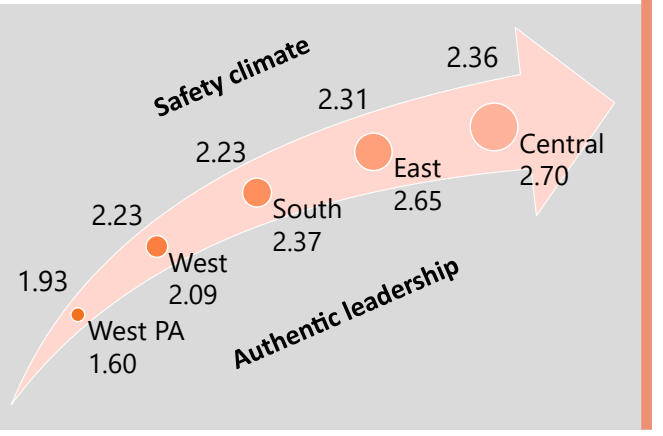
Spearman's rho statistical test was used to further investigate the relationship between AL and SC. Results revealed significant positive relationships between all AL factors and SC. As levels of AL increased, so did SC at moderate (moral; $p < .001$, $r = .380$) to moderately high (composite; $p < .001$, $r = .471$) levels. The correlation matrix in Table 3 (p. 20) displays the results of the analysis.

Age & Experience

Interestingly, age and years of experience were negatively correlated with AL and SC. The older the employee, the lower the perceived AL behaviors and lower the SC scores. To better understand the impact of age and years of experience on the relationship between authentic leadership and safety climate, partial correlation analyses were performed. The results were consistent with the relationships previously discussed. When age and years of experience were controlled, effect sizes increased to a strong effect when controlling for age ($p < .001$, $r = .503$), a strong effect for years of experience ($p < .001$, $r = .505$), and a strong effect when controlled both age and years of experience at once ($p < .001$, $r = .503$).

FIGURE 1

MEAN COMPOSITE SCORES BY LOCATION



To determine whether certain age groups or years of experience impacted the relationships more than others, the authors grouped the variables. Groups were created by dividing both age (younger, middle, older) and years of experience (rookie, experienced, veteran) into three groups. Significant differences were discovered between the lower third and upper third for each group. The analysis continued by dividing years of experience into four groups to explore new employees (2 or fewer years), newer employees (3 to 10 years), experienced employees (11 to 19 years), and veterans (more than 20 years). The most interesting result was that a significant difference was discovered between the experienced and veteran groups for SC. The mean values of SC gradually decreased for new employees, newer employees and experience employees from 2.36 to 2.22. However, a sharp drop occurred (2.04) in workers who had 11 to 19 and more than 20 years of experience.

Multiple regression analyses were performed after the authors explored two important assumptions. First, the predictor variables (AL, age, years of experience) were moderately correlated with the outcome variable SC and second, that multicollinearity was not a concern. AL and age, and AL and years of experience were correlated with moderate effect sizes, meeting the requirement of both assumptions. However, because age and years of experience were strongly correlated, multicollinearity was a concern; therefore, the authors did not examine the combined predictors of age and years of

TABLE 3

VARIABLE CORRELATIONS: SAFETY CLIMATE, AUTHENTIC LEADERSHIP, AGE, YEARS OF EXPERIENCE

	Safety climate	Self-awareness	Balanced processing	Relational transparency	Internalized moral perspective	Composite score
Safety climate	---	.445	.441	.469	.380	.471
Age	-.222	-.245	-.185	-.244	-.209	-.240
Years of experience	-.270	-.253	-.220	-.260	-.216	-.253

Note. All relationships significant at the 0.01 and .001 alpha levels.

experience in one model. The first model examined AL and age as predictors of SC. The authors found that the model was a significant predictor of SC, $F(2,150) = 35.25$, $p < .001$. AL and age had a strong relationship ($R = .565$, $R^2 = .320$) and predicted 32% of the proportion of variation in SC. In other words, almost one-third of SC can be explained by AL and age. The second model examined AL and years of experience as predictors of SC. Like age, the authors found that the model was a significant predictor of SC, $F(2,150) = 36.91$, $p < .001$. AL and years of experience had a strong relationship ($R = .574$, $R^2 = .330$) and predicted 33% of the proportion of variation in SC.

Discussion

The authors found a direct relationship between higher perceived authentic leadership behaviors and how workers perceive how management handles safety. The authors also found that older and more experienced workers reported lower perceptions of authentic leadership and exhibited lower appreciation for a safety climate. The findings suggest that the most experienced employees may not appreciate or even have bad attitudes toward safety. In summary, the results do not suggest that there are major challenges associated with any specific age or years of experience group. However, it appears that leaders must find ways to further engage older and more experienced workers. Older and more experienced workers may contribute to safety-related challenges directly (e.g., overconfidence contributing to an incident) or indirectly (e.g., exhibiting bad attitudes toward leadership or safety, negatively influencing younger workers). The results of the present study support the claim that authentic leadership development interventions should be used to improve safety climate and subsequent positive outcomes.

An authentic leadership development model that applies the characteristics defined by Avolio et al. (2007) can help supervisors and other leaders improve four specific categories. First, leaders must be more self-aware. Behaviors include seeking feedback from others including followers or direct reports, understanding how others view the leader, reevaluating their position on issues, and showing an understanding of how their actions impact others. An example is when leaders solicit employee (follower) candid feedback on how they handle safety issues. The second characteristic of an authentic leader is balanced processing. A leader needs to solicit views that differ from their convictions, carefully analyze (objective) data, and listen carefully to others before a decision is made. An example of this is when management and leaders look for safety incident causes rather than guilty employees. The third characteristic of an authentic leader is relational transparency. Behaviors that can be developed include communicating in a direct manner (e.g., say what you mean, avoid political speak), admitting mistakes, encouraging others to speak their mind, being honest and telling followers the truth even if it is something difficult (e.g., they are not ready to be a supervisor yet), and being consistent with emotions and feelings (i.e., avoid hiding true emotions). Another example of relational transparency is providing candid and constructive feedback when observing an unsafe behavior, and providing an environment where the observed person can explain the behavior reasoning so that continuous improvement results. The fourth and final characteristic of an authentic leader is internalized moral perspective. Behaviors include showing integrity or being consistent with beliefs and actions, making decisions that align with the leader's core values, encouraging others to take a position on their core values, and making decisions based on high ethical standards. An example of internalized moral perspective is consistently maintaining safe standards over productivity results. Based on the outcomes of this study, learning to consistently exhibit the behaviors the authors describe will result in an improved safety climate and in general a safer place to work.

The present study has limitations of a statistically appropriate yet relatively small sample size that was obtained from one organization. Future research may look to divide results by job position. Interventions and activities include but are not limited to teaching authentic behaviors to safety professionals and supervisors. Sparrowe (2005) states interventions could include journaling and the use of self-narratives to support the development of self-awareness. Kuchinka (2020) applied this model by creating a manual and 6-week leadership development program that helps develop servant leaders, with an emphasis on being authentic. Behaviors are easy to change temporarily; however, programs must be designed to develop established habits and core values, which are needed to truly be an authentic leader. Kuchinka's training model includes education, scenario descriptions and hypothetical actions, applied behavior, and reflection both in writing (journaling) and in team workshops. Trainees are then asked to mentor others as they proceed through the program a second time.

Conclusion

The goals of the present study were to 1. explore the relationship between safety climate and authentic leadership in a manufacturing organization, and, by doing so, 2. provide evidence,

examples, and explanations for safety professionals and organizational leaders so they can 3. develop an effective safety climate. Walumbwa et al. (2008) support the need for leaders to be authentic in their behaviors to promote the importance and improvement of the workplace safety climate.

The authors effectively addressed the goals of this study during the investigation of a company's frontline workers and their leadership at a compressed gas company. First, the authors found that workers at five different work areas in four states valued safety climate at higher levels as their leaders exhibited authentic leadership behaviors. Next, the authors' data provide evidence to show that at a location, for example, where safety challenges occurred at higher levels, the leadership was also lacking in effective authentic leadership skills. Similarly, the authors expected and confirmed that where safety outcomes were more positive, key managers were, simply put, better leaders. For example, they would prioritize safety over performance even when their own personal and professional objectives (e.g., higher performance numbers that could lead to a bigger bonus) conflicted with the decision.

The continued mission of the authors is to help managers, decision-makers and leaders at all levels learn to be more authentic as part of efforts to create an effective organizational safety climate. Ideally, safety professionals and leaders who read the findings of the present study will prioritize leadership development in their organizations, subsequently leading to a more positive safety climate. The authors desire to see more engaged employees and a safer workplace, fewer injuries and improved performance, all of which will have an overall positive impact on the success of an organization and its employees. **PSJ**

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