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CORY HIGGS
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CIP LEADERSHIP AND EVALUATION: THE INFLUENCE ON CAUSAL TRANSMISSION
AND CREATIVITY

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BY THE COMMITTEE CONSISTING OF

Dr. Michael Mumford, Chair

Dr. Shane Connelly

Dr. Jorge Mendoza

Dr. Scott Gronlund

Dr. Ryan Bisel

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Abstract

While there are a variety of theories on outstanding leadership which differ in notable ways, the more recognized approaches all stress the importance of leader vision. One of the most critical aspects of leader's mental models is the causal connections made among concepts within their models. These causal connections may then be evaluated by their followers, either positively or negatively. The present study examines three leadership styles, as well as valence of evaluation on the vision, and their influence on creativity. Participants in the study were asked to assume the role of marketing director in a creative scenario where they were given a CEO's vision statement and tasked with creating a plan to help the dying car company. Plans were evaluated for their quality, originality, and elegance, as well as rated for causal similarity to the three leadership styles. Findings indicate that followers of ideological leaders demonstrated higher originality in their plans, identified more causes, and demonstrated greater causal similarity to their leader. Implications of these findings for creative research are discussed.

Keywords: leadership, followers, evaluation, leadership styles

CIP Leadership and Evaluation: The Influence on Causal Transmission and Creativity

The area of leadership is, and has been, the focus of a great deal of research. Whether it be with respect to their behaviors (Fleishman, 1953), their abilities, skills, and characteristics (Mumford, Todd, Higgs, McIntosh, 2017; Zaccaro, Connelly, Repchick, Daza, Young, Kilcullen, Gilrane, Robbins, & Bartholomew, 2015), or their interactions with others (Graen & Uhl-Bien, 1995). And for good reason – outstanding leaders throughout history have shown that they can have an exceedingly positive influence on society (e.g., Mahatma Gandhi, who advocated for Indian civil rights and led a non-violent independence movement) or a decidedly more negative one (e.g., Donald Trump, who dismissed the severity of COVID-19 and proliferated false election claims).

In recent years, more attention has been paid to different "styles" of leadership and the ways in which they may influence others. For example, studies of charismatic leadership, and the closely related concept of transformational leadership (Mumford, 2006; Conger, 1999), indicate that a leader's articulation of an evocative vision can influence both follower motivation and follower performance (Antonakis & Gardner, 2017; Banks, Engemann, Williams, Gooty, McCauley, & Medaugh, 2017; Shamir, House, & Arthur, 1993). Indeed, while there are a variety of theories on outstanding leadership styles which differ in significant ways, it has become clear that the more recognized approaches all share a common thread: they stress the importance of vision (Antonakis & House, 2002; Conger & Kanungo, 1998; Kim, Dansereau, & Kim, 2002). A leader's vision, or a set of beliefs on how people should act and interact in order to attain and idealized future state, has been shown to be a powerful and pervasive mechanism of influence for leaders.

In fact, studies of leader vision have shown that articulation of a viable vision is related to a variety of indices held to be critical for leadership, including organizational performance, follower motivation, and leader satisfaction (Deluga, 2001; Sosik, Kahai, & Avolio, 1999; Dumdum, Lowe, & Avolio, 2002). Ultimately, this view of vision implies that vision formation is a cognitive construct – or in other words, intertwined with one's mental model.

Mental models, or the conceptual representations used to understand system operations and guide actions, are used to specify key causal linkages and the likely outcomes of causal actions (Holyoak & Thagard, 1997; Largan-Fox & Code, 2000). Specifically, Mumford and Strange (2002) have argued that there are 2 types of mental models: descriptive and prescriptive mental models. A descriptive mental model reflects the system as it is, while a prescriptive mental model reflects the system as it might be. People formulate their descriptive mental models based on their prior experience and knowledge. This experience, however, also implies feedback, both social and individual, which reveals strengths and/or weaknesses in any given system. This induces reflection, and based on this reflection, a search for the key causes and goals. After reconfiguring these idealized causes and goals, a person's prescriptive mental model emerges and is applied to articulate and address the issues at hand. This prescriptive mental model then gives rise to vision formation. In other words, leaders must first understand the system as it is (i.e., descriptive), then they reflect and attempt to understand the system as it should be (i.e., prescriptive). This is then transmitted through to their followers via their vision.

Causal Analysis

Bearing this in mind, one of the most critical aspects of leader's mental models is the causal connections made amongst concepts in their models. Indeed, identifying potential key causes has been shown to influence a number of factors related to performance. For instance, in a

study done by Hester and colleagues (2012), undergraduates were given, or not given, a self-paced causal analysis training module and subsequently assessed on creative problem-solving. It was found that causal analysis training, or in other words training individuals to work with and identify more critical causes, resulted in better mental models (in terms of various subjective and objective attributes), as well as more creative solutions (rated on quality, originality, and elegance).

Similarly, a study done by Marcy and Mumford (2010) also employed causal analysis training in a study using undergraduates in a leadership simulation game. Within this game participants were asked to take on the role of a University president tasked with improving educational quality at their University. It was found that training in causal analysis increased creative performance across all conditions, regardless of other variables involved.

It is important to note, when using their prescriptive mental model, leaders articulate a vision detailing what they believe the most critical causes are within the system, which followers would then ideally adopt. This should come as no surprise. Leaders communicate to followers what they believe the causes to a problem are, and the followers will then accept them. However, while this may seem a simple and intuitive process, it is currently unclear as to what factors influence the actual adoption of causes from leader to follower. No research has been done currently examining the specific mechanisms by which this may occur.

Leadership Styles

One potential mechanism of differing causal transmission may be via distinct leadership styles. Mumford (2006) has outlined 3 different styles of outstanding leadership (charismatic, ideological, and pragmatic), all of which employ different mental models, or in other words different views of the world. What this means, and has been demonstrated, is that these different

styles of outstanding leadership all espouse different causes in the application of their mental models.

For instance, when we consider charismatic leaders, they articulate a positive, future-oriented vision which lacks clarity and views causes under the control of their followers. Mobilization of mass support in their followers is viewed as critical to executing their agenda, thus, charismatic leaders will espouse a variety of positive goals to motivate and inspire their followers.

In contrast, ideological leaders articulate negative, past-oriented visions which focus on previous deficiencies and failures. This focus on failures makes it hard to specify causes, but instead, means they form their mental model around extant goals. This "tunnel vision" means that ideologues lack a broader appeal in their visions, but are particularly powerful for those that do adopt them. Indeed, they view situational influences as a key causal force, meaning they are less driven to motivate followers and more driven to change the system to fit their beliefs.

Finally, pragmatic leaders stress neither causes nor goals when applying their mental models, instead relying on the present situation and crafting solutions to the problems posed. They view the situation as a complex system where causes and goals are intertwined, meaning they focus on the specific task(s) in front of them, excelling when they are allowed to directly focus on problem-solving. It's important to note that pragmatic leaders, as a result, tend to appeal to the few who can adequately grasp the complex situation in which they are acting, lacking the emotionally charged vision evidenced by the other styles and, thus, the motivation of their followers.

Considering the behavioral differences evidenced by these leader styles, it is important to note that differences between these styles have also been evidenced in regard to performance, or

more specifically, creative performance. For example, in a study done by Bedell-Avers, Hunter, and Mumford (2008), these three leadership styles were examined in regard to people's preferred style and subsequent performance in various types of problems. It was found that each style evidenced success in different types of problems. Pragmatic individuals, in particular, performed consistently well, especially in complex problems similar to those calling for greater creativity.

Bearing all of this in mind, it should then be clear that 1) different leadership styles stress different causes, 2) these causes will be communicated to followers via their vision, and 3) performance differences arising from the application of these causes may be evidenced. This leads to my first two hypotheses.

Hypothesis 1: Those who receive a pragmatic leader vision will demonstrate creative plans of higher quality, originality, and elegance compared to those who receive a charismatic or ideological vision.

Hypothesis 2: Those who receive a pragmatic leader vision will demonstrate a higher number of causes identified and greater criticality of causes identified compared to those who receive a charismatic or ideological vision.

As mentioned earlier, however, what is unclear is if leadership style, as evidenced through a vision, will induce adoption of similar key causes in followers who are tasked with solving a problem. This leads to my research question.

Research Question 1: Will participants identify and work with similar causes to the particular CIP leader vision presented to them?

Evaluation of Leader Vision

Aside from leadership style having an influence on the way followers view causes, it is also important to consider that visions can be evaluated by followers, either positively or negatively. They may view a leader's vision as particularly compelling, with little to no flaws, or they may view a leader's vision without the rose-colored glasses, seeing deficiencies or problems with their vision. While many leaders seek out feedback and evaluation, it is also true that there are some who may actively discourage critical evaluation of their vision, seeking to maintain only followers who fully adopt it.

For example, as a result of their negative, past-oriented visions, ideological leaders tend to appeal to a small cadre of followers who share their ideals and beliefs. While perhaps not as evocative as charismatic leaders, the followers who do adopt the vision of ideological leaders will be particularly motivated, and will have a strong sense of shared identity with the leader and their vision. This results in a highly cohesive group which strictly reinforces and maintains the vision (Mumford, 2006).

When considering followers evaluation of a vision, a variety evidence has been provided demonstrating that evaluation is a critical aspect of creative thought (Halpern, 2003; Simonton, 1999; Baer, 2003; Gorman & Plucker, 2003). Similarly, it has been shown that adopting a balanced thinking strategy (e.g., thinking about negative outcomes/means for attaining success or positive outcomes/avoiding failure) results in better creative problem solutions compared to those who simply adopt a positive thinking strategy (McIntosh, Mulhearn, & Mumford, 2021). It is thought that thinking negatively on a situation facilitates investment of more cognitive resources, which then leads to a more complete, analytic diagnosis of the situation at hand in order to avoid failure. Problem solutions, which are inherently practical and procedural, are then

held to be generated by more negative thought, and more specifically, more investment towards thinking about causes. It may be the case that negative evaluation of a leader's vision may encourage better identification of critical causes, leading to more creative problem-solving. However, it is unclear how evaluation may influence causal analysis / creativity when it is a leader's vision being examined, as opposed to ideas of their own, or that of a peer. Thus, this leads to my last two hypotheses.

Hypothesis 3: Those who engage in negative or balanced evaluations of their leader's vision will demonstrate creative plans of higher quality, originality, and elegance compared to those who engage in positive evaluation or do not evaluate it at all.

Hypothesis 4: Those who engage in negative or balanced evaluations of their leader's vision will demonstrate a higher number of causes identified and greater criticality of causes identified compared to those who engage in positive evaluation or do not evaluate it at all.

Method

Sample

The 137 undergraduate students who agreed to take part in this study were recruited from the online SONA recruitment pool at a large southwestern university and provided extra credit in an introductory psychology course for their participation. Subjects ranged in age from 18 to 37 and were primarily freshman at the university (61.4%). Due to incomplete or blank responses, 5 participants were excluded from analyses leaving a total of 132 subjects (61 males and 71 females).

General Procedures

Participants completed the task via an online Qualtrics survey and were automatically randomly assigned to one of 12 conditions upon beginning the survey. The study was set up as a

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3 (charismatic, pragmatic, or ideological leader vision) x 4 (positive evaluation, negative evaluation, positive and negative evaluation, or no evaluation) between-subjects factorial design. During the first section of the study, participants were asked to complete a set of timed covariates. Subsequently, participants were provided a scenario and asked to assume the role of marketing director tasked with helping a struggling car company. During the next section of the study, participants were asked to provide written responses to a series of prompts, including an email from the CEO (i.e., the leader) of the company who provided a vision statement. During the last portion of the study, participants were asked to complete a series of untimed covariates and, on the final screen, debriefed on the study.

The present study was based on a low fidelity simulation exercise from earlier work by Marta, Leritz, & Mumford (2005). This particular simulation was selected for use in the present investigation based on undergraduate student's familiarity with general business and automotive issues.

Within the simulation, participants were asked to assume the role of a marketing director working for the Edisun car company, provided background information on the organization, and then asked to formulate a "comprehensive plan that will address the declining sales at Edisun, and build a strong foundation for future innovation". They were told that they had been put "in contact" with the CEO of the company via an email in which a vision statement (charismatic, pragmatic, or ideological) for Edisun was provided. After reading through the relevant vision statement, they were asked to evaluate the CEO's vision (positively, negatively, or both positively and negatively), or provided a prompt which asked what their favorite mode of transportation was, and why (no evaluation).

After working through these prompts, participants were then asked to provide a written plan for the Edisun car company. Judges appraised the quality, originality, and elegance of these marketing plans, as well as the number of causes identified by participants, the criticality of those causes identified, and the causal similarity to the three CIP leadership styles. In addition to this, participants were also asked to complete various measures describing their perceptions of the leader, including one measure examining identification with the leader and one measuring the quality of their relationship with the leader.

Covariates

Divergent Thinking

Merrifield, Guildford, Christensen, and Frick's (1962) Consequences Test was used to assess divergent thinking. Participants were presented with five highly unlikely situations (e.g., what would happen if human life continued without death, what would happen if everyone lost the ability to use their arms and legs, etc.). For each situation, they are asked to generate as many potential consequences that they can think of in two minutes. The number of consequences generated per question were counted and scored as fluency. Evidence bearing on the construct and predictive validity have been provided by Merrifield et al. (1962) and Vincent, Decker, and Mumford (2002).

Intelligence

Participants were asked to complete the Employee Aptitude Survey (EAS). The 30 items measure presents a set of facts in which subjects are then asked to indicate whether a subsequent answer is true, false, or unknown given these facts. Evidence bearing on the validity of this measure has been provided by Grimsley, Ruch, Warren, and Ford (1985) and Ruch and Ruch (1963).

Leader Identification

Personal identification with the leader was drawn from earlier work by Mael and Ashforth (1992). This nine-item scale presents a series of behavioral statements (e.g., When someone criticizes the leader, it feels like a personal attack, etc.) which participants are asked to rate on a five-point scale on the extent to which they agree with the statements. Mael and Ashforth (1992) and Shamir and Kark (2004) have provided evidence for the validity of this scale as a measure of identification with a leader.

Leader Relationship Quality

Graen and Uhl-Bien's (1995) leader-member exchange measure was utilized. This seven-item measure asks participants to assess their relationship with a leader (e.g., How would you characterize your working relationship with the CEO, etc.) on 4 or 5-point scales indicating how much agree with the item presented. Graen and Uhl-Bien (1995) have provided validity evidence for this measure.

Self-Perceived Leadership Style

Bedell-Avers, Hunter, and Mumford's (2008) measure for describing behaviors of charismatic, ideological, and pragmatic leaders was used. Participants are presented with varying descriptions of CIP leaders and their behaviors, and instructed to indicate which leader they feel most similar to by circling the corresponding letter. Validity evidence can be found in Bedell-Avers, Hunter, and Mumford (2008).

Need for Cognition

Petty, Cacioppo, and Kao's (1984) Need for Cognition scale was used to measure motivation for solving creative problems. This 18-item self-report scales asks people to describe behavior with respect to intellectually challenging tasks on a 5-point rating scale (e.g., the notion

of abstract thinking is appealing to me, etc.). Validity evidence for this measure has been provided by Cacioppo and Petty (1982).

Planning. Marta, Leritz, and Mumford (2005)'s measure of planning skills was included as the creative task used inherently requires planning. Subjects are presented with six scenarios, and following a single scenario, then presented with five or six questions bearing on various planning skills. Following these questions are sets of 8 to 12 response options that reflect more, or less, effective applications of the planning skills in consideration. Individuals are asked to select their two or three preferred options from the list of response options provided. The measure is scored for the number of effective options selected. Evidence bearing on the validity of the measure has been provided by Marta, Leritz, and Mumford (2005) and Osburn and Mumford (2006).

Independent Variables

Leadership Style

After reading through the background material, participants were presented with an email in which the leader (i.e., the CEO) described their vision for Edisun. Around a third of the participants received an email reflecting a charismatic leader vision, another third received an email reflecting a pragmatic vision, and the final third received an email reflecting an ideological vision. See appendix for vision statements.

The vision statements were developed based on past work by Antonakis, Fenley, and Liechti (2011), Antonakis, d'Adda, Weber, and Zehnder (2014), Mumford (2006), Bedell-Avers, Hunter, and Mumford (2008), and Shamir, House, and Arthur (1993). These statements were adapted to reflect the particular characteristics of the leadership styles at hand. For instance, the charismatic vision stressed positive, future, success based on the input of the talented workforce

with goals being achieved through the help of these individuals. The ideological vision, in contrast, stressed negative, past-oriented, success driven by strong beliefs and values.

Evaluation

Once participants were presented with the leader vision, they were subsequently asked, or not asked, to evaluate that vision. Participants within the positive evaluation group were told, "Now that you've seen the CEO's vision, please evaluate the potential strengths of this vision. What is good about it? How might it lead to success?" Similarly, those in the negative evaluation group were told, "Now that you've seen the CEO's vision, please evaluate the potential weaknesses of this vision. What is bad about it? How might it hinder success?" Those in the neutral evaluation group (i.e., positive and negative evaluation) were told, "Now that you've seen the CEO's vision, please evaluate the potential strengths and weaknesses of this vision. What is good or bad about it? How might it lead, or not lead, to success?" Finally, those assigned to the no evaluation group were asked, "What is your favorite mode of transportation (e.g., car, bicycle, train, plane, etc.)? Briefly explain why.".

Dependent Variables

Creative Performance

Written marketing plans were evaluated by two judges for quality, originality, and elegance (Besemer & O'Quin, 1999). Both judges were doctoral students in Industrial and Organizational Psychology familiar with the creativity literature.

Quality was defined as logical, potentially workable solutions. Originality was defined as unexpected, surprising, solutions. Elegance was defined as a solution where solution elements flowed together in a coherent, seamless, fashion. Using these definitions, the panel of two judges were asked to complete a three-hour training program. In this training program, judges were

initially familiarized with the task participants were to perform and the expected products. Consequently, judges were then asked to appraise a sample of 20 marketing plans using these ratings scales. Judges then convened to discuss and resolve any discrepancies. Following training, the inter-rater judge agreement coefficients obtained for quality, originality, and elegance evaluated were .79, .75, and .75, respectively.

Causal Analysis

Causal analysis refers to the identification of key causes within a problem when considering solutions to that problem. Five components of causal analysis (charismatic causal similarity, pragmatic causal similarity, ideological causal similarity, number of causes identified, and criticality of causes) were rated. All three causal similarity variables were rated in a three-point scale ranging from 1 (causes displayed no similarity to charismatic/pragmatic/ideological causes) to 3 (causes displayed significant similarity to charismatic/pragmatic/ideological causes). Additionally, number of causes identified was rated on a six-point scale ranging from 1 (participant identified 1, or 0, causes) to 6 (participant identified 6 causes), while criticality of causes was rated on a five-point scale ranging from 1 (participant did not identify critical or relevant causes) to 5 (participant identified the most critical or relevant causes).

Causal Similarity – Charismatic

The extent to which the participants identified causes reflected those of a charismatic leadership style. Evidenced by locus of causation lying in people's actions (e.g., "Lack of innovative employees"). The interrater agreement coefficient (rwg) for charismatic causal similarity was .77.

Causal Similarity – Ideological

The extent to which the participants identified causes reflected those of an ideological leadership style. Evidenced by locus of causation lying in situational influences (e.g., "New competitors and bad reputation"). The interrater agreement coefficient (rwg) for ideological causal similarity was .74.

Causal Similarity – Pragmatic

The extent to which the participants identified causes reflected those of a pragmatic leadership style. Evidenced by locus of causation lying in people's actions and situational influences; focus on complex problem-solving (e.g., "Reliance on brand loyalty doesn't work if quality has decreased"). The interrater agreement coefficient (rwg) for pragmatic causal similarity was .84.

Number of Causes Identified

A numerical count of the distinct causes listed by participants. The interrater agreement coefficient (rwg) for number of causes was 1.

Criticality of Causes Identified

The importance or relevance of the causes identified to the scenario at hand. The interrater agreement coefficient (rwg) for criticality of causes was .73.

Analysis

A series of analysis of variance (ANOVA) tests were used to determine the effects of the two manipulations on quality, originality, and elegance, as well as number of causes identified, criticality of causes identified, and causal similarity to the three CIP leadership styles. No covariates were found to be significantly related to the outcomes. Table 1 shows correlation values amongst the variables of interest.

Results

Creativity

No significant effects were found between manipulations of leadership style and evaluation on quality and elegance. However, Tables 2 and 3 present the effect of leadership style on originality. A significant main effect was found for the leadership style manipulation ($F(2,131) = 3.97$, $p = .02$). Specifically, participants who received an ideological vision ($M = 2.50$, $SE = .14$) demonstrated more original plans than those who received a charismatic vision ($M = 2.08$, $SE = .15$) or a pragmatic vision ($M = 1.97$, $SE = .14$).

Causal Analysis

No significant effects were found between manipulations of leadership style and evaluation on criticality of causes. However, Tables 4 and 5 present the interaction effect of leadership style and evaluation on number of causes identified. A significant interaction effect was found between the leadership style and evaluation manipulations on number of causes identified ($F(6,128) = 2.18$, $p = .05$). Specifically, participants who received a charismatic vision or ideological vision identified the most causes when asked to make a negative evaluation of the vision ($M = 4.78$, $SE = .55$; $M = 5.33$, $SE = .47$, respectively), while those who received a pragmatic vision identified the most causes when not asked to make any evaluation ($M = 4.55$, $SE = .49$).

Additionally, no significant effects were found between manipulations of leadership style and evaluation on charismatic causal similarity or pragmatic causal similarity. However, Tables 6 and 7 present the interaction effect of leadership style and evaluation on ideological causal similarity. A significant interaction effect was found between the leadership style and evaluation manipulations on ideological causal similarity ($F(6,128) = 3.47$, $p = .00$).

Specifically, participants who received an ideological vision generally demonstrated higher ideological causal similarity than those who received a charismatic vision or a pragmatic vision (see Table 6). However, of note, those who received an ideological vision and were not asked to evaluate the vision showed the lowest ideological causal similarity out of all groups (M = 1.25, SE = .14).

Discussion

To begin, let us directly address our first two hypotheses, of which neither were supported in the present study. More specifically, those who received a pragmatic leader vision did not evidence significantly higher creativity, nor greater causal analysis. This finding goes against prior research which suggests that a pragmatic leadership style may lead to greater creative performance (Bedell-Avers, Hunter, & Mumford, 2008). However, findings did show that those who received an ideological vision evidenced significantly higher originality in their marketing plan than the other two leadership styles. Ideological leaders, with their negative, past-oriented visions and keen focus on few transcendent goals, may naturally introduce constraints onto their followers by asking them to reach a previously attained idealistic goal, but avoiding prior mistakes / using different means. Previous research on ideological leaders supports this finding that they lend themselves towards influencing follower creativity (Mumford, 2006), however, the much of these findings were demonstrated using a historiometric lens, as opposed to the experimental one used here. Similarly, research on constraints would support this explanation, as it has been demonstrated that introducing the right amount of constraints on creative problem-solving can produce more creative problem solutions (Medeiros, Partlow, & Mumford, 2014). Perhaps further research on the perception of constraints embedded within leader visions is warranted.

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Moving on to our second set of hypotheses, we similarly saw little effect of evaluation valence on ratings of both creativity and causal analysis in the present study. However, a two-way interaction was found between leadership style and evaluation on the mean number of causes identified, such that having a balanced approach (evaluating the vision both positively and negatively) provided the most consistent number of identified causes across groups. This is seemingly supported by previous research which suggests a balanced thinking strategy positively impacts creative problem-solving (McIntosh, Mulhearn, & Mumford, 2021). Perhaps the lack of results seen for evaluation on our variables of interest may be explained by our assignment of the evaluation group, as opposed to having an open response for evaluation which could then be rated. It may be the case that participants were already evaluating the leader's vision naturally as they read through it, before reaching the subsequent evaluation prompt screen. Future studies may seek to remedy this by using a think-aloud (Fonteyn, Kuipers, & Grobe, 1993) protocol to determine participant's vision evaluation process.

Finally, with respect to our research question, we once again found little evidence in the current study to suggest that individuals actually identify and work with causes that are similar to the leadership style whose vision they receive. With that said, there was a significant two-way interaction between leadership style and evaluation on ideological causal similarity, such that those who received an ideological vision statement demonstrated the highest causal similarity when asked to evaluate it positively or negatively, but the lowest score when not asked to evaluate at all. Considering that ideological leaders typically evidence a small group of highly committed followers, it would be reasonable to then assume that their followers may demonstrate the most causal similarity when solving creative problems. However, this conclusion is not fully supported based on our findings. Perhaps leadership style is only one of a multitude of factors

that contribute to causal transmission from leader to follower. For instance, the telling / repeating of leader stories may potentially aid in causal transmission by providing direct examples of the causes that leader has worked with and utilized previously. Previous research on leader stories have shown that such cases can influence sensemaking processes as well as ethical decision-making (Watts, Ness, Steele, & Mumford, 2018; Watts, Steele, & Mumford, 2019). Future research may also seek to use a video format, as opposed to text, to address what may be a lack of engagement on the part of participants. A video, using an actor, to deliver a leader's vision may influence the results as it may be particularly compelling, where simply reading one may fall flat. Important to note here, however, is that the majority of leader visions are not viewed this way but instead seen over paper / email.

Bearing these findings in mind, there are a variety of implications stemming from the present study that should be mentioned. To begin, the sample used in this study was restricted to undergraduate students, so caution should be taken when generalizing the results found here to other populations. Along related lines, participants were only presented with one scenario pertaining to one domain: a car company. Although similar tasks have been successfully used in multiple earlier studies of leadership (e.g., Partlow, Medeiros, and Mumford, 2015; Strange & Mumford, 2005), it remains that it is only one task.

Additionally, it should also be recognized that the undergraduate students who participated in this study were presented with a low-fidelity simulation exercise. Participants were not asked to make decisions regarding a real automotive organization and it's issues, but were instead given a realistically constructed hypothetical scenario in which all manipulations were presented in a fixed order. This ensures control but cannot speak to how the results may have differed if participants were presented with materials that included real-life individuals or if

participants were presented manipulations in a different order. With this in mind, low fidelity simulations have been shown to be predictive of regular performance (Motowidlo, Dunnette, & Carter, 1990).

Lastly, the time frame in which the study took place and data was collected may present a limiting factor, as the period of time in which Donald Trump was president of the United States may have exerted influence on the thinking of citizens. More specifically, the period of time in which Donald Trump was president may be viewed as a particularly contentious time period within in the United States, presenting a crisis situation in which many may have unknowingly adopted thinking habits of the former president. In times of crisis individuals look towards an emerging leader for assistance, and this may have been the case here (Mumford, 2006).

While it is difficult to reach any conclusions based on the current study, and the interpretations drawn are mostly speculative, the findings here suggest that the influence of ideological leaders on their followers is particularly strong, in agreement with the findings of Mumford (2006). Indeed, the emergence of a particularly engaging ideological leader may exert an exceedingly high influence over their followers causal analysis and subsequent creative thinking. We hope that the present study provides an impetus for future research along these lines.

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Table 1

Correlations between manipulations and dependent variables of interest

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Vision_C	1.000																						
2. Vision_P	-.466**	1.000																					
3. Vision_I	-.498**	-.535**	1.000																				
4. Eval_P	0.000	-0.037	0.036	1.000																			
5. Eval_N	-0.027	0.013	0.013	-.327**	1.000																		
6. Eval_B	-0.027	0.050	-0.023	-.327**	-.320**	1.000																	
7. Eval_Z	0.052	-0.024	-0.026	-.347**	-.340**	-.340**	1.000																
8. NumCau	0.003	-0.119	0.113	-0.018	0.018	0.081	-0.078	1.000															
9. Criticality	-0.014	-0.151	0.162	0.171	-0.021	-0.052	-0.097	.679**	1.000														
10. Causes_C	0.019	-0.035	0.015	0.150	-0.090	0.005	-0.065	.395**	.527**	1.000													
11. Causes_P	-0.013	-0.089	0.100	0.055	0.109	-0.038	-0.123	.607**	.733**	.377**	1.000												
12. Causes_I	-0.044	-0.052	0.093	0.085	0.093	0.007	-.180*	.443**	.415**	-0.025	.539**	1.000											
13. Quality	0.016	-0.158	0.139	-0.038	0.104	-0.049	-0.016	0.002	.198*	0.082	0.124	0.032	1.000										
14. Originality	-0.079	-0.166	.238**	-0.030	-0.045	0.057	0.018	0.141	.194*	0.101	0.153	0.024	.734**	1.000									
15. Elegance	-0.006	-0.171	.173*	0.045	-0.016	-0.016	-0.013	0.027	.253**	0.119	.183*	0.009	.741**	.787**	1.000								
16. DT_Fluency	-0.160	0.041	0.112	0.069	0.057	-0.042	-0.082	0.061	0.101	0.099	0.129	0.028	0.113	0.086	0.020	1.000							
17. Int_EAS	0.153	-0.123	-0.026	0.098	0.018	0.088	-.198*	-0.017	0.008	-0.109	-0.040	0.030	0.116	0.076	-0.011	.177*	1.000						
18. Lead_ID	0.018	-0.092	0.072	-0.054	-0.054	-0.004	0.109	-0.020	0.082	-0.023	0.141	0.039	0.055	0.107	0.115	-0.045	-0.062	1.000					
19. LMX	-0.023	-0.057	0.078	0.023	0.012	-0.024	-0.011	-0.111	-0.104	-0.055	0.007	0.030	0.054	0.060	0.084	0.043	-.214*	.537**	1.000				
20. LS_C	0.018	-0.051	0.033	0.075	0.013	-0.108	0.019	0.032	0.160	0.010	0.099	-0.031	0.097	0.082	0.054	0.058	0.027	0.146	0.054	1.000			
21. LS_I	0.110	-0.020	-0.086	-0.033	-0.055	0.030	0.056	-0.109	-.192*	-0.133	-.200*	-0.036	-0.064	-0.084	-0.147	0.014	0.123	-.188*	-0.065	-0.095	1.000		
22. LS_P	-0.113	0.036	0.073	-0.027	0.046	0.062	-0.079	0.076	0.053	0.095	0.102	0.058	0.007	0.029	0.099	-0.034	-0.113	0.080	0.045	-.566**	-.758**	1.000	
23. NFC	-0.134	-0.036	0.163	-0.049	-0.018	0.019	0.047	-0.060	0.043	-0.014	0.134	0.107	0.123	0.136	.180*	0.053	.185*	0.163	0.145	-0.061	-0.003	0.049	1.000

Note. Vision_C = charismatic leader vision seen; Vision_P = pragmatic leader vision seen; Vision_I = ideological leader vision seen; Eval_P = positive evaluation; Eval_N = negative evaluation; Eval_B = both positive and negative evaluation; Eval_Z = no evaluation; NumCau = number of causes identified; Criticality = criticality of causes identified; Causes_C = charismatic causal similarity; Causes_P = pragmatic causal similarity; Causes_I = ideological causal similarity; Quality = quality of marketing plan; Originality = originality of marketing plan; Elegance = elegance of marketing plan; DT_Fluency = divergent thinking; Int_EAS = intelligence; Lead_ID = leader identification; LMX = leader relationship quality; LS_C = perceived leadership style – charismatic; LS_I = perceived leadership style – ideological; LS_P = perceived leadership style – pragmatic; NFC = need for cognition
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Table 2

ANOVA results for Originality

	SS	df	MS	F	p	Partial η^2
Main Effects						
Leader Style	7.28	2.00	3.64	3.97	0.02	0.06
Evaluation	0.78	3.00	0.26	0.28	0.84	0.01
Interactions						
Leader Style*Evaluation	1.65	6.00	0.27	0.30	0.94	0.01

Note: *SS* = Type III Sum of Squares, *df* = degrees of freedom, *MS* = Mean Square, *F* = F-ratio, *p* = significance level, Partial η^2 = effect size estimate.

Table 3

Inspection of Originality means by Leadership Style

Leadership Style	Mean Originality	Std. Error	95% CI Lower Bound	Upper bound
Charismatic	2.08	0.15	1.78	2.39
Pragmatic	1.97	0.14	1.68	2.26
Ideological	2.50	0.14	2.23	2.78

Table 4

ANOVA results for Number of causes identified

	SS	df	MS	F	p	Partial η^2
Main Effects						
Leader Style	6.75	2.00	3.37	1.26	0.29	0.02
Evaluation	3.41	3.00	1.14	0.42	0.74	0.01
Interactions						
Leader Style*Evaluation	35.14	6.00	5.86	2.18	0.05	0.10

Note: *SS* = Type III Sum of Squares, *df* = degrees of freedom, *MS* = Mean Square, *F* = F-ratio, *p* = significance level, Partial η^2 = effect size estimate.

Table 5

Inspection of Causes Identified interaction means

Leadership Style	Evaluation	Mean Causes Identified	Std. Error	95% CI Lower Bound	95% CI Upper bound
Charismatic	Positive	4.00	0.52	2.97	5.03
Charismatic	Negative	4.78	0.55	3.70	5.86
Charismatic	Both	4.33	0.55	3.25	5.42
Charismatic	None	4.58	0.47	3.65	5.52
Pragmatic	Positive	4.30	0.52	3.27	5.33
Pragmatic	Negative	3.27	0.49	2.29	4.25
Pragmatic	Both	4.42	0.47	3.48	5.35
Pragmatic	None	4.55	0.49	3.57	5.52
Ideological	Positive	4.69	0.45	3.79	5.59
Ideological	Negative	5.33	0.47	4.40	6.27
Ideological	Both	5.18	0.49	4.20	6.16
Ideological	None	3.50	0.47	2.56	4.44

Table 6

ANOVA results for Causal similarity - Ideological

	SS	df	MS	F	p	Partial η^2
Main Effects						
Leader Style	0.29	2.00	0.14	0.61	0.55	0.01
Evaluation	1.08	3.00	0.36	1.51	0.21	0.04
Interactions						
Leader Style*Evaluation	4.93	6.00	0.82	3.47	0.00	0.15

Note: *SS* = Type III Sum of Squares, *df* = degrees of freedom, *MS* = Mean Square, *F* = F-ratio, *p* = significance level, Partial η^2 = effect size estimate.

Table 7

Inspection of Causal Similarity – Ideological interaction means

Leadership Style	Evaluation	Mean Causal Similarity - Ideological	Std. Error	95% CI Lower Bound	95% CI Upper bound
Charismatic	Positive	1.50	0.15	1.20	1.80
Charismatic	Negative	1.78	0.16	1.46	2.10
Charismatic	Both	1.56	0.16	1.23	1.88
Charismatic	None	1.79	0.14	1.51	2.07
Pragmatic	Positive	1.75	0.15	1.45	2.05
Pragmatic	Negative	1.50	0.15	1.21	1.79
Pragmatic	Both	1.79	0.14	1.51	2.07
Pragmatic	None	1.59	0.15	1.30	1.88
Ideological	Positive	2.00	0.14	1.73	2.27
Ideological	Negative	2.04	0.14	1.76	2.32
Ideological	Both	1.73	0.15	1.44	2.02
Ideological	None	1.25	0.14	0.97	1.53

Figures

Figure 1

Background information provided to participants

Please read the following scenario. You will be asked later to generate a plan that would best suit the Edisun Car Company.

San Francisco based Edisun Car Company designs and manufactures high quality vehicles for sale in the domestic U.S. market. Edisun Car Company developed the first official "sports utility" model in the United States. The Edisun Car Company also manufactures small trucks. However, for years, this company has thrived at being the top sports utility manufacturing company in the nation. Their showcase sports utility model, called the Terrain, earned a reputation as being owned by all types of people from top executives to homemakers. This all encompassing reputation helped make the Terrain the top selling sports utility vehicle for many years and an icon of wealth and ruggedness. Other factors included strong dealership network. Both customers and dealers who sold the Terrain have shown high loyalty to the Edisun brand name.

In the last decade, many manufacturing companies have started building sports utility vehicles making them the most widely purchased vehicles in the world. The Edisun Car Company's main competitor is the Atom Car Company. Currently Edisun Car employs around 5000 individuals, with many executives and middle managers. However, most of the workers are relatively inexperienced and are working at the Edisun Car Company to supplement their incomes. Major problems in quality of the Terrain and other vehicles manufactured by Edisun Car Company have caused a loss in revenue. Product innovations and improvements have also declined since the company first started manufacturing vehicles.

As the newly appointed Director of Marketing, you have been brought in to help turn the Edisun Car Company around. Your task is to formulate a comprehensive plan that will address the declining sales at Edisun, and build a strong foundation for future innovation.

Before detailing your plan, the President of Edisun Car Company has reached out to you via email to outline their vision for the company going forward.

Figure 2

Charismatic leader vision

To: marketdir@edisun.org
From: apres@edisun.org
Subject: The future of Edisun

Welcome to the Edisun family!

There is an exciting opportunity to make very substantial, important, and necessary improvements to our company. At the moment, it appears that we must make drastic changes to increase and improve the quality of our vehicles, as well as make large strides toward innovating into the future.

The board has unwavering faith in your ability and believes that by drawing on your extensive list of past successes, you will be able to form a wildly successful new vision and bring about a future golden-age of automotive breakthroughs for our organization and, eventually, the world.

Moreover, we strongly believe that by making use of the immensely talented individuals around you, you can easily find your way to a wealth of inspiration and success. It is important to keep in mind, however, that realizing the revolutionary new vision for Edisun must not hinder other aspects of the company – we expect your plan to provide the shining example of success that all other auto manufacturers will wish they had envisioned.

Figure 3

Pragmatic leader vision

To: marketdir@edisun.org
From: apres@edisun.org
Subject: The future of Edisun

Welcome to Edisun!

At a recent meeting, our board and I determined that company performance is mediocre by national standards, and must be improved.

It is essential that past errors and mistakes are not to be dwelled on, and that your focus is placed on solving the complex problems at hand within the organization and market as a whole.

To begin to solve this problem, it is critical that you draw on your previous experiences, both good and bad, to help guide the improvement of organizational performance.

The board believes that by using talented individuals around you and by placing them in situations where they can succeed and thrive, you will be able to solve these pertinent concerns.

It is important to keep in mind, however, that solving this problem must not get in the way of other organizational areas – and we expect you to make decisions necessary to handle

Figure 4

Ideological leader vision

To: marketdir@edisun.org
From: apres@edisun.org
Subject: The future of Edisun

Welcome to the Edisun family!

At our last meeting, the board and I determined that our automotive innovation has substantially declined over the years, and is now poor by national standards.

Something must be done to achieve the successes we once enjoyed in the past. We believe that by examining previously failed attempts, and considering them in our plans, it may be possible to determine what could be done to help transcend such failures and arrive at a place of substantial automotive achievement.

We also believe that by focusing on organizational culture, and developing new goals based on our beliefs and values, it may be possible, although difficult, to correct such errors and help improve organizational performance.

The board is also aware that there are other aspects of the company to be aware of, but stress that it is important to be focused on the most critical company activities that will help restore us to our past success.