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Ambiguity and Freedom of Dissent in Post-Incident Discussion

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Abstract: The after-action review (AAR) is a discussion technique some high-reliability organizations employ to encourage learning via collective retrospection. AARs are an effective communication tool for promoting reliability if they are held regularly. One way to encourage frequent AARs is to increase participants' satisfaction with these meetings. This study examined the impact of post-incident, pre-discussion ambiguity and freedom of dissent on participant satisfaction with AARs. Firefighters ($N = 119$) completed a survey on their most recent AAR. As predicted, the level of post-incident, pre-discussion ambiguity was negatively related to AAR satisfaction. Freedom of dissent, however, attenuated the negative influence of ambiguity on AAR satisfaction.

Since the publication of Karl Weick's (1979) influential book, *The Social Psychology of Organizing*, scholars of communication and organizational behavior have been interested in the capacity of retrospective sensemaking to shape how groups and organizations adapt to environmental change and learn from past actions. Sensemaking is the process by which groups detect ambiguous shifts in their environments, bracket off portions of their information environments for further attention, collaboratively select interpretations of emergent events, and retain successful interpretive schemes for relevant situations in the future (Weick, 1995). Effective sensemaking is necessary "in order not to be blindsided by threats, unprepared for opportunities, or ineffective in managing interdependencies with resource controllers and other important stakeholders" (Sutcliffe, 2001, p. 197).

In recent years, sensemaking theory has been applied to the study of high-reliability organizations (HROs; Weick, Sutcliffe, & Obstfeld, 2005). HROs regularly maintain safe operations in turbulent, high-risk environments without serious errors. They promote mindful attention to detail as a means of preventing minor errors from evolving into large-scale failures (Weick & Roberts, 1993). Weick and Sutcliffe (2007) suggest that effective HROs engage in retrospective discussion that reflects a "reluctance to oversimplify interpretations" and fosters an "error-friendly learning culture" because it allows members to mindfully reflect not only on successes but also on mistakes and "near misses" (pp. 9-22).

The after-action review (AAR) is one technique some HROs employ to encourage learning via retrospective discussion. A form of strategic organizational communication, AARs are a kind of work meeting in which people discuss (formally or informally) and attempt to learn from a recent event on which they collaborated (Allen, Baran, & Scott, 2010; Busby, 1999; Ellis, Mendel, & Nir, 2006). These meetings are sometimes called post-incident critiques, post-incident analyses, debriefings, or hot washes. AARs occur after the conclusion of an incident or training exercise, regardless of whether the perceived outcome of the action was positive or negative. The purpose of AARs is to enhance retrospective sensemaking so employees can "maintain their preoccupation with failures, stay attuned to normal

operations, and learn from misses or near misses that occur routinely in the work environment" (Allen et al., 2010, p. 750).

In addition to fostering reliability via learning, Allen et al. (2010) recently found a positive relationship between the frequency with which AARs are held and the safety climate. This finding suggests that AARs are a useful communication tool for promoting safety if they are held regularly. One way to encourage frequent AARs is to influence positively participants' satisfaction with these meetings. This study addresses two potential barriers to achieving that satisfaction: (a) the level of post-incident ambiguity to be managed during the AAR and (b) the extent to which AAR participants perceive that they are allowed to express dissenting points of view during these discussions.

Theorizing Retrospective Discussion

Scholars have recommended AARs as an approach to organizational learning that conceptualizes retrospective discussion as central to continuous improvement of individual and group cognition (Busby, 1999; Carroll, 1995). Huber (1996) suggests that this collective retrospection may promote double-loop learning (Argyris & Schon, 1978). Double-loop learning is a form of organizational, group, or individual learning in which agents can question and modify underlying goals and procedures of the learning process itself (Argyris, 1977). For example, if repeated attempts at a goal are unsuccessful regardless of what may have been learned from those attempts, then a modification of the goal itself might be wise. Thus, learning of a second order occurs. Rather than learning a new way to reach a certain goal, the agent instead learns about the validity of the goal itself. Applying this newly learned information often means modifying the goal. Double-loop learning is often a product of dissent, discussion, and honest retrospection concerning the usefulness and validity of organizational, group, or individual goals and the coordinated actions taken in pursuit of them.

Through such retrospection, collaborators are able to adapt their actions on the basis of emerging outcomes as well as appraise and potentially modify the values and assumptions that led to those actions. The retrospective discussion that happens in AARs is unlikely to foster double-loop learning without constructive communication practices that enable collaborators to manage ambiguity. For example, facilitators need to ensure that members both receive and perceive opportunities to act as full participants in these discussions. This is done by constructively presenting insights and concerns regarding a prior incident about which others may have differing contributions, opinions, explanations, and points of view (Gherardi, Nicolini, & Odella, 1998; Schwarz, 1994). These challenges are exacerbated to the extent that significant ambiguity remains about what happened in the prior incident and why. In addition to examining the impact of this post-incident, pre-discussion ambiguity, this study also investigates the influence of one relevant communication variable, freedom of dissent, on the ability of AAR participants to manage this ambiguity in a satisfying manner.

After-Action Reviews

Although AARs are a fairly common practice, particularly in military and paramilitary settings (Allen et al., 2010; Baird, Holland, & Deacon, 1999; Ellis & Davidi, 2005), scholars have rarely examined them. The few empirical studies available tend to focus on what kind of learning is accomplished in AARs and whether the incident context shapes how much is learned. In a qualitative study, Busby (1999) concluded that AARs are an effective way for participants to correct errors in others' thinking and manage hindsight bias. However, the information available to the participants often did not aid in the diagnosis of problems, and the interpretation of events frequently was ahistorical.

Other studies examine the utility of AARs conducted after successful versus failed events. Ellis and Davidi (2005) found that soldiers doing consecutive navigation exercises perform better when debriefed on both failures and successes as compared to soldiers who were only debriefed on their failures. In a subsequent experiment, Ellis et al. (2006) found that individuals learn about as much from successful events as negative ones as long as reviews of successful events still discuss wrong actions. They also concluded that AARs improve individual performance, particularly when the reviews develop internal and specific attributions for failure or success.

Meeting Satisfaction

Another important outcome of AARs not unrelated to learning is participants' satisfaction with those meetings. If participants find these discussions satisfying, it seems logical to expect that they will feel more motivated to engage these interactions constructively. Generally speaking, people claim to not like meetings and view them as interruptions or hassles throughout the workday (Micale, 1999; Rogelberg, Leach, Warr, & Burnfield, 2006). However, there is a growing body of literature suggesting that significant benefits (e.g., increased job satisfaction) accompany participant satisfaction with work meetings (Rogelberg, Allen, Shanock, Scott, & Shuffler, 2010). Briggs, Reinig, and de Vreede (2006) define meeting satisfaction as positively valenced affective arousal on the part of an individual toward meetings experienced in their workplace. Rogelberg et al. (2010) found that meeting satisfaction is a unique predictor of overall job satisfaction apart from traditional facets of job satisfaction (i.e., promotion opportunities, satisfaction with pay, coworkers, supervision, and the work itself), even when controlling for communication satisfaction (i.e., overall satisfaction with communication at work, horizontal communication satisfaction, organizational integration communication satisfaction, and role ambiguity).

Research on antecedents to meeting satisfaction/quality has focused on both structure and process issues (e.g., Cohen, Rogelberg, Allen, & Luong, 2011; Nixon & Littlepage, 1992). Taking a focus on process, Nixon and Littlepage found that open communication, keeping on task, a systematic approach, and timeliness of the meeting all related to meeting effectiveness. In contrast, Cohen et al. (2011) focused more on structure, finding that meeting design characteristics (e.g., agenda usage, facility quality, meeting facilitator, lighting, etc.) are important predictors of meeting quality. Yet meetings are used for a host of different purposes (e.g., brainstorming, information sharing, decision making, etc.), and not all of them benefit from all the previously researched antecedents to meeting satisfaction. For example, in an information sharing meeting, exceedingly open communication might hinder the dissemination of information because people feel comfortable speaking up about the merits of the information shared. Thus, the research focusing on meetings in general does not fully apply to AARs, which are a very specific meeting type that emphasizes collaborative sensemaking processes. This unique format lends itself to meeting characteristics likely to promote participant satisfaction from a collaborative perspective.

Previous research on meetings suggests various antecedents of participant satisfaction, including perceived meeting goal attainment (Briggs et al., 2006), meeting procedural justice (McComas, Tuit, Waks, & Sherman, 2007), and the degree to which the meeting facilitator shows interest in participants and encourages their input (McComas, 2003). Specifically, McComas (2003) found that when meeting organizers "were genuinely interested in participants' comments," participants' satisfaction with the meeting increased (p. 164). Furthermore, the goal attainment model of meeting satisfaction suggests that meetings that accomplish the purposes for which they were called are more satisfying for participants and generally more effective. A major goal of AARs is collaboratively making collective sense of a recent event and developing a relatively coherent narrative of the success and/or failure that occurred. This collaborative process is likely more satisfying when AAR meeting participants perceive that they at least had the *opportunity* to contribute to the process for which the meeting was called (e.g., to make sense of a

prior incident or to make a decision), separate and apart from whether the said opportunity was embraced. Taken together, this research suggests AARs that accomplish their goals, are effectively executed (e.g., facilitator behaviors), and provide a forum where participants are presented with genuine opportunities to share opposing thoughts, feelings, and ideas (e.g., freedom of dissent) are likely to be perceived as more satisfying. As organizations seek to adopt AARs, it seems reasonable that they would want to do so in a way that favorably affects satisfaction with that process. However, meetings held for the purpose of making sense of ambiguous events (e.g., AARs) on which participants collaborated from different vantage points likely present challenges to the accomplishment of meeting satisfaction, an issue we take up in the following section.

Post-Incident Ambiguity

The nature of the event under discussion in an AAR is likely to influence the content of that discussion and potential satisfaction with it. As we described above, previous studies of AARs account for the nature of the event by assessing whether it is considered a failure or a success. Alternatively, our approach concerns how much ambiguity about the event remains once it has concluded but before the AAR begins. Some incidents are relatively simple and routine, requiring less discussion, whereas other incidents are unusual and complex, requiring collaborators to process the incident through collective retrospection that is lengthier and more complex. Thus, we define post-incident ambiguity as the extent to which members perceive that there are multiple, plausible interpretations of the nature and significance of the event (Baran & Scott, 2010; Scott & Trethewey, 2008) before it is discussed retrospectively. Generally, there is a positive relationship between event ambiguity and the number of double interacts or communication cycles needed to reduce it in post-incident discussion (Kreps, 1980; Miller, Joseph, & Apker, 2000; Weick, 1979). This suggests that more ambiguous events will require retrospective discussions that are longer and involve more points of view that potentially conflict. However, we do not assume that AARs should or even could fully eliminate ambiguity. Indeed, as Eisenberg (1984) suggests, some level of strategic ambiguity often has its benefits.

There are several reasons to expect that the level of event ambiguity could be an important factor shaping the satisfaction of AAR participants. When events are more ambiguous, there is a greater need to manage equivocality through retrospective discussion. This discussion involves (a) highlighting what features of the information environment are worthy of attention (enactment), (b) constructing interpretations through an intersubjective process to reduce ambiguity (selection), and (c) emphasizing interpretive schemes and lessons learned to be used in future, similarly equivocal incidents (retention; Weick, 1979, 1995). Additionally, with greater ambiguity comes greater potential for conflicting points of view about what is worth additional attention and how to interpret what happened and why it happened. Although conflict merely increases opportunities for disagreement and does not necessarily result in dissent, it does increase the salience of perceived freedom of dissent in appraisals of satisfaction with AARs. When people collaborate in time urgent situations involving high levels of equivocality, it makes sense to assume that differing points of view on the incident are likely to become a factor in post-incident discussion. It is reasonable, therefore, to further assume that under conditions of high ambiguity, perceived freedom of dissent likely becomes a factor in how individuals appraise their satisfaction with AARs. Although such ambiguity can motivate retrospective discussion about those disagreements (Kramer, 1999), it can also create additional interpersonal barriers that make AARs less satisfying. Participants are more likely to discuss problem situations that may be attributed to or explained by the actions of individuals within the group rather than outside parties (Broome & Keever, 1989). In such cases, there is increased potential for blaming, defensiveness (Gibb, 1974; Kearney, Plax, & Burd, 1984), and even further ambiguity. These kinds of outcomes are likely to complicate retrospective discussion and render it less satisfying. Finally,

when events are highly ambiguous, more information (i.e., opinions, observations, ideas, points of view, explanations) needs to be processed, requiring more time and effort on the part of participants. Collectively, these factors suggest that high levels of post-incident ambiguity limit the capacity of sensemakers to have satisfying AAR meetings.

Hypothesis 1: Post-incident ambiguity will be negatively related to AAR meeting satisfaction.

Moderating Role of Freedom of Dissent

Communication research on dissent in the workplace has generally regarded *organizational* dissent, which Kassing (1997) defines as the "expression of disagreement or contradictory opinions that result from feeling apart from one's organization" (p. 311). Empirical studies of organizational dissent, which can be distinguished from the dissent construct examined in this study, focus on the nature of dissent (Kassing, 1998), the various audiences to whom dissenting messages are directed (Kassing, 1997, 1998), message tactics used in the expression of upward dissent (Kassing, 2002, 2007; Krone, 1992), perceptions of dissenters (Kassing, 2001), dissent-triggering actions (Kassing & Armstrong, 2002), as well as the individual (Kassing & Avtgis, 1999), relational (Kassing, 2000b), and organizational (Kassing, 2000a) antecedents of dissent expression. Generally, organizational dissent research focuses on antecedents of dissent and communication strategies and tactics used to express dissent more than on the outcomes of expressed dissent or perceived freedom to dissent. Such work has focused less on examining the extent to which individuals perceive *freedom* to dissent, particularly in group settings and in the context of a specific discussion. Research on a related construct, freedom of speech, has typically focused on an organizational rather than group referent and has typically not involved context specific measurement (e.g., freedom of speech in meetings; Kassing, 2000b).

Although workplace dissent is often discouraged, it is associated with a number of positive outcomes when others are receptive to it. Redding (1985) suggests that dissent allows for corrective feedback about a range of behaviors and problems, including ineffective decision making and unethical practices. Kassing (1998) found that dissenting employees have higher job satisfaction, higher organizational commitment, and more satisfying supervisory relationships. Similarly, Gordon and Infante (1980) found higher levels of organizational commitment and job satisfaction among employees who perceived they had freedom of speech in their workplaces. Although the dissent research reviewed here generally assumes that the objects of dissent are organizational phenomena, it is not unreasonable to draw two inferences from these findings. First, perceptions that one can express dissent during an AAR without fear of punishment may have positive consequences regardless of whether dissent is actually expressed. Here we refer to a conclusion based on participation in the meeting that dissent is even an allowable response to differences of opinion. Second, a perception that such dissent will be met with some degree of openness might also have positive consequences separate from whether dissent is actually expressed. Therefore, in this study, we define *freedom of dissent* as the perception that one is allowed to express dissent without fear of punishment or recrimination within one's immediate work group.

Aside from the consequences of dissent for those who express it, perceived openness to dissent may have a positive impact on retrospective discussion, particularly in HRO contexts where it is recommended that decisions migrate toward expertise more than rank or authority (Weick & Sutcliffe, 2007). In the context of AARs, participants may perceive communication that questions values and assumptions as dissent to the extent that it involves objections to the views of other participants about the nature of previous events. If participants do not perceive freedom to dissent in these contexts, then they might censor themselves. In these circumstances, the would-be dissenter and even other participants could begin to question the value and authenticity of the forum (i.e., AAR discussions) and be less satisfied with them. It also stands to

reason that a related, second-order effect will result when dissent is perceived as unwelcome. If individuals act on a perceived lack of freedom to dissent and choose not to object to the views and assumptions of other AAR participants, the group might lack the information and insight needed to resolve the post-incident ambiguity under discussion. However, if participants perceive that dissent *is* welcome in AARs, they may be more likely to contribute to the interactions that foster the learning for which AARs are intended. This should lead to more positive perceptions of AARs. For these reasons, we expect that freedom of dissent will have positive effects on the capacity of AAR groups to resolve post-incident ambiguity in a satisfying way. Thus, we propose:

> **Hypothesis 2:** Freedom of dissent will moderate the negative relationship between post-incident ambiguity and AAR meeting satisfaction such that the relationship will be weaker when freedom of dissent is high.

Method

Sample and Procedure

To test our hypotheses, we chose to examine data collected from active career (nonvolunteer) firefighters within a large municipal fire department in the eastern United States. We received human subjects approval to carry out the research as described here. Work within the fire service involves frequent encounters with occupational hazards (e.g., extreme temperatures, toxic smoke and fumes, collapsing structures, etc.) and limited room for error. Many fire departments try to minimize accidents and injuries through AARs (Allen et al., 2010). Thus, the fire service functioned as an ideal setting in which to study AARs, ambiguity, and quality of the review experience. With the permission of departmental officials, we distributed an electronic survey to departmental personnel; 119 (25.14%) participants responded to the survey. Most of the respondents were male (95.1%), Caucasian (92.6%), middle-aged ($M = 36.08$ years, $SD = 7.86$), and experienced in terms of years as a firefighter ($M = 10.54$ years, $SD = 6.68$). All respondents indicated that they had, at the minimum, completed high school, with a sizable portion reporting that they attended some college (63.4%) or completed a bachelor's degree (23.2%). Respondents were asked to reflect on their most recent call as well as their AAR subsequent to the call and complete the survey accordingly.

Measures

We collected responses regarding the ambiguity of the call, satisfaction with the last AAR, freedom of dissent, and relevant control variables. With the exception of the satisfaction measure, the remaining measures (i.e., ambiguity and freedom of dissent) used scales with 5-point response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Ambiguity of the Call. Based on previous research concerning ambiguity and sensemaking, a seven-item measure was created to assess the level of ambiguity of the call preceding the AAR. Respondents were asked to "please state how much you agree with the following statements about how you felt once the call was over but BEFORE you discussed it as a company." Sample items include "I still had some unanswered questions about the call" and "I wasn't sure whether what I did was effective." The scale demonstrated a high level of internal consistency (Cronbach's $\alpha = .89$).

Freedom of Dissent. To assess the degree to which respondents perceived voicing contradictory viewpoints as acceptable within their work groups, we first investigated similar measures in the literature. We adapted a measure based on scales developed by Gordon and Infante (1980) and Kassing (1998). Both of these measures assess aspects of what we wanted to measure, namely, the degree to which

respondents felt like they could vocalize points of view about the incident that diverge from other group members, including the captains who facilitate those discussions. We examined the items contained within both measures for conceptual consistency with the construct we wished to measure and chose three items. The three items were "I felt I had freedom of speech," "There was fear of expressing your true feelings about a call," and "I was hesitant to raise questions or contradictory opinions." The scale demonstrated an acceptable level of internal consistency (Cronbach's $\alpha = .81$).

Satisfaction With Last AAR. A six-item scale adapted from Rogelberg et al. (2010) was used to assess participants' satisfaction with their last AAR. Participants were asked to think about their last after-call discussion and indicate whether certain words described that meeting. Sample items include "stimulating," "boring," and "satisfying." This measure was designed to be similar in terms of content, scoring, and appearance to the measurement approach used for the Job Descriptive Index (JDI; Balzer et al., 1997; Stanton et al., 2001) and the Job in General scale (Ironson, Smith, Brannick, Gibson, & Paul, 1989) that have been employed in decades of job satisfaction research across the organizational sciences. As with the JDI and other satisfaction scales, a three-point response scale was used (yes, no, and ?). After reverse scoring negatively worded items, the measure was coded just like the JDI: "yes" was coded as a 3; "no" coded as a 0; and "?" coded as a 1. A mean composite was then calculated with scores ranging from 0 to 3, and the internal consistency of this scale was acceptable (Cronbach's $\alpha = .72$). For more explanation of the weighted scoring of the "yes," "no," and "?" response options, see Smith, Kendall and Hulin (1969).

Control Variables. Age, gender, and tenure were assessed as potential control variables. Also, education level was assessed by asking "which of the following best describes you education experience?" Response options included "some high school," "high school graduate," "some college," "college graduate," "some graduate school," and "graduate degree."

Results

Discriminant Validity of the Constructs

Using LISREL 8.80 software (Jöreskog & Sörbom, 2006) with maximum-likelihood estimation, we first examined the distinctiveness of ambiguity of the call, freedom of dissent, and satisfaction with the last AAR. We compared the fit of three nested models from a one-factor model to the proposed three-factor model (see Table 1). Each more differentiated model fit the data better, as indicated by chi-square difference tests, than the one-factor model (James, Mulaik, & Brett, 1982). The three-factor model treating all three constructs as distinct factors had the highest comparative fit index and nonnormed fit index values and the lowest root-mean-square error of approximation value of all models tested. All items exhibited loadings on their respective factors at .43 or above (see Table 2).

Variable Correlations

Table 3 lists the descriptive statistics and zero-order correlations among variable measures. The ambiguity of the call was negatively related to satisfaction with the AAR ($r = -.22$, $p < .05$), supporting Hypothesis 1. Also, none of the proposed control variables correlated significantly with the dependent and independent variables. According to Becker (2005), these "impotent control variables" should not be included because doing so only reduces statistical power and does not add to the explanatory power of the tested model. Thus, these variables were not used in subsequent analyses.

Moderating Role of Freedom of Dissent

Standard hierarchical regression analysis was used to test for the moderating role of freedom of dissent in the relationship between ambiguity and AAR satisfaction (Hypothesis 2). Following recommendations by Cohen, Cohen, West, and Aiken (2003), the independent variables were centered (ambiguity and freedom of dissent) to aid in interpretation and to reduce nonessential multicollinearity. In Step 1, ambiguity and freedom of dissent were entered. In Step 2, the interaction term created by multiplying ambiguity with freedom of dissent was entered. As displayed in Table 4, freedom of dissent predicted satisfaction with the last AAR. When entered concurrently with freedom of dissent, ambiguity no longer significantly predicted satisfaction with the last AAR. The interaction term significantly predicted satisfaction with the last AAR. This suggests that the relationship between ambiguity of the call and satisfaction with the last AAR depends in part on the level of freedom of dissent during the discussion.

To further aid our interpretation, we plotted the lines representing the relationships between ambiguity and AAR satisfaction at different levels of freedom of dissent (i.e., at one standard deviation above and below the mean (cf. Cohen et al., 2003) in Figure 1. The form of the interaction is consistent with our hypothesis indicating that the negative relationship between ambiguity and AAR satisfaction is weaker for those with higher levels of freedom of dissent. The slope of the line for the high level of freedom of dissent (i.e., one standard deviation above the mean) is nearly flat rather than negative. Furthermore, the figure suggests that at even higher levels (>1 *SD* above the mean) of freedom of dissent, the relationship between post-incident ambiguity and AAR satisfaction may switch from negative to positive.

Additionally, simple effects tests (Aiken & West, 1991) were conducted to further test the nature and significance of the moderation effect (Hypothesis 2). The effects tests revealed nonsignificant relationships between ambiguity of the call and AAR satisfaction at one standard deviation above the mean of freedom of dissent, $t(118) = .36, p > .05$. Also, the effects tests indicated a significant negative relationship between ambiguity of the call and AAR satisfaction at one standard deviation below the mean level of freedom of dissent, $t(63) = -2.28, p < .05$. In line with Hypothesis 2, the slope of the line representing the relationship between ambiguity of the call and satisfaction with the last AAR when freedom of dissent was high was significantly different from the slope of the line representing the relationship between ambiguity of the call and satisfaction with the last AAR when freedom of dissent was low, $t(63) = 2.10, p < .05$.

Discussion

The findings reported above indicate that post-incident ambiguity challenges the capacity of collaborators to have satisfying AAR discussions but that perceived freedom of dissent significantly reduces ambiguity's negative impact. Specifically, we found that the level of ambiguity after the call but before the AAR is negatively related to satisfaction with the AAR. However, the negative effects of this ambiguity on AAR satisfaction are tempered when participants perceive sufficient freedom to dissent during the AAR. These results suggest a number of implications for theory as well as practice.

Implications for Theory

These findings underscore the challenges collaborators face when attempting to discuss ambiguous incidents retrospectively. Sensemaking theory (Weick, 1979, 1995) suggests that the primary purpose of retrospective communication is to reduce ambiguity and that a positive relationship exists between the level of ambiguity and the number of communication cycles needed to reduce it (Kreps, 1980; Miller et al., 2000). Although we did not measure the number of communication cycles, the negative relationship detected between call ambiguity and AAR satisfaction in the current study is consistent with this

underlying premise in sensemaking theory. In the context of AARs, this means that although heightened ambiguity about an incident provides an impetus for discussion that seeks to reduce it, it also makes the conduct of those discussions potentially more challenging.

Another potential reason for this negative relationship between post-incident ambiguity and AAR satisfaction could be unrealistic expectations concerning the ease with which these discussions will proceed. When AARs feature a greater range of interpretations (i.e., of what happened, why it happened, and what the event means) than anticipated, discussion will likely take more time and involve more conflict (latent or expressed). This could negatively violate participants' expectations regarding the ease and length of discussion, resulting in diminished satisfaction with the AAR itself. Although more research is needed to support this explanation, it is consistent with past research on how expectancy violations influence appraisals of communication (Burgoon & Hale, 1988; Kassing & Avtgis, 2001; Kernahan, Bartholow, & Bettencourt, 2000; Mendes, Blascovich, Hunter, Lickel, & Jost, 2007; Rink & Ellemers, 2007). Finally, the finding that freedom of dissent tempers the negative relationship between post-incident ambiguity and AAR satisfaction provides another partial answer to the question of why greater ambiguity seems to result in diminished meeting satisfaction. The ostensible purpose of an AAR is to provide a forum for relatively open discussion of various points of view on the incident so as to foster learning and continuous improvement. In our analysis, when freedom of dissent is particularly high, the relationship between call ambiguity and AAR satisfaction is actually slightly positive, suggesting that when participants perceive freedom to openly disagree with others about a prior incident, call ambiguity could actually foster more satisfying discussions. This suggests the possibility that the lessons learned in the course of collectively managing post-incident ambiguity lead participants to be more satisfied with the AAR experience (i.e., worth the time and effort). Alternatively, when participants do not perceive openness to divergent perspectives and observations, they may feel apart from the group (Kassing, 1998) and see the AAR process as less legitimate and worthwhile, factors that are likely to diminish AAR satisfaction. In more ambiguous conditions, when there are more viable interpretations, explanations, and perspectives, the salience of freedom of dissent might be heightened, tempering the likelihood that individuals will find the discussions satisfactory.

Practical Implications

The current study and findings provide several important implications for practice. First, a practical implication of our finding regarding the relationship between post-incident ambiguity and meeting satisfaction is that AAR leaders should consider the level of post-incident, pre-discussion ambiguity. As they facilitate AARs following highly ambiguous situations they should appraise their own expectations for the AAR, how they intend to facilitate the AAR, and what setting is most appropriate for this discussion. For example, in conditions of high ambiguity, leaders should anticipate discussions that feature a greater range of interpretations, involve more conflict, and take longer to reach a satisfying resolution. Indeed, given our argument above regarding negatively violated expectations, perhaps facilitators should even consider how they might prepare participants to expect discussions that are more complex, time consuming, and requiring greater tolerance for ambiguity. This is congruent with prior qualitative research (e.g., Baran & Scott, 2010) that suggests coping with ambiguity is a key feature of leadership processes within dangerous contexts.

Second, the current study focuses on an HRO setting where retrospective sensemaking is encouraged, and time is typically provided for such activities. However, managers in non-HRO settings can use these findings as well. As just one example, in retail organizations, each customer service interaction provides a key sales opportunity. Engaging in post-customer discussions may provide a way for managers to encourage the sharing of valuable tactics and tools for promoting sales. Additionally, not all customer

service interactions proceed well, and many may end in lost sales where the associates are still uncertain about what happened and why. Managers who recognize the learning opportunity this ambiguity provides and encourage open retrospective talk during post-customer discussions will likely improve overall performance of their sales teams. When held among groups or teams of employees, AARs can function as opportunities to manage ambiguity and encourage group learning and feedback simultaneously.

Third, with regard to freedom of dissent, AAR leaders should consider to what extent they actively invite participants to present their opinions openly, even when they contradict prevailing views of the incident. AARs are often held immediately after an event when memories are fresh, but given the cognitive and physical fatigue that participants may be experiencing, particularly in the emergency response context, it is easy to see how participants may perceive that expressed dissent is likely to alienate them from the group. If freedom of dissent is not actively highlighted by the facilitator, participants may be reluctant to articulate dissent not only because it would involve the expression of differing points of view but also because it might require additional time and effort for the group to process it. For this reason, AAR facilitators should consider issuing regular reminders that the purpose of the discussion is to learn from the incident rather than generate unanimity regarding what happened and why. Although dissent may not always be warranted, the perception that it is at least generally welcome seems to promote satisfaction with AARs, a factor that should in turn promote regular use of this important communication tool.

Finally, these findings along with Allen et al. (2010) and Baran and Scott (2010) add to the evidence of the critical role that supervisors play in reliability seeking organizations. Allen et al. (2010) argue for the important role that AARs have in promoting safety climate. This study suggests that AARs facilitated by supervisors who emphasize that dissenting points of view are welcome will be perceived as more satisfying efforts. Taken together, this pattern of findings supports Zohar's (2008) assertion that "the core meaning of safety climate concerns managerial commitment, with all other variables . . . assuming a secondary role" (p. 377). How a supervisor handles ambiguity, dissent, and AARs and how seriously the supervisor takes these issues may have a profound effect on important safety-related outcomes.

Limitations and Future Research

Although the current findings provide a valuable contribution to the literature on AARs, retrospective sensemaking, and freedom of dissent, the study is not without limitations that provide opportunities for continued inquiry. First, our finding that freedom of dissent moderated the relationship between ambiguity and AAR satisfaction seems to indicate how the conflicting points of view that often accompany incident ambiguity are managed in AARs shapes participants' satisfaction with those discussions. However, our survey did not ask participants to indicate whether their sense of what happened during the incident conflicted with that of other participants, particularly the discussion leader. Future research should explore this explanation in more detail. Additionally, future work in this area should also attempt to discern qualitatively the process by which perceptions about freedom of dissent are developed. For example, what kinds of messages lead AAR participants to perceive that dissent is discouraged, and what communication practices persuade discussants that dissent is genuinely welcome?

A second limitation stems from the way that dissent is framed in the study relative to the enactment of dissent within the AAR meeting context. Dissent is framed as an individual's perception of the degree to which they have the freedom to disagree with the organization and others in the organization with relatively limited repercussions. Although this is consistent with previous research and conceptualization of dissent (e.g., Kassing, 1997, 1998), it fails to acknowledge the collective processes occurring within the AAR meetings that are further embedded within the larger organizational context. Future research needs to consider group and organizational level processes that affect the perception of dissent and the

degree to which these higher-order processes negate the benefits of freedom of dissent. For example, freedom of dissent could be, in part, a function of the degree of group cohesion within a given AAR meeting context. Perhaps in highly cohesive groups, individuals feel they can openly disagree without repercussions. Or, perhaps these cohesive groups are largely homogeneous in nature and therefore there is limited dissent regardless of the perception that dissenting is okay? These and other questions can be answered as research builds off the initial individual-level findings presented here.

Third, this study does not fully rule out potential methodological issues related to common method bias. Common method bias is an issue in some correlational research. All the measures used in this study were completed using the same survey format. This creates a potential common underlying method factor, which may cause the various scales to correlate more strongly with each other (Crocker & Algina, 1986). Although our measures were completed on the same survey, we followed some of the methodological recommendations by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) for mitigating the effects of common method bias. Namely, we provided for complete anonymity and confidentiality of the respondents in an effort to reduce evaluation apprehension. However, we did not incorporate certain of Podsakoff et al.'s recommendations (e.g., methodological separation of constructs or multiple sources for data) due to constraints imposed by the method employed and the organization that provided us access. However, because the focal analysis is an interaction, concern about method bias is mitigated slightly. Because interactions are multiplicative rather than additive, it is unlikely that the specific pattern of relationships found in this study are due to common method bias (Hofmann, Morgeson, & Gerras, 2003).

Fourth, the generalizability of the findings is limited because all data come from one organization. It is possible that certain aspects of the organization could affect the relationships examined here. For example, the organization may be more receptive to using retrospective sensemaking tools such as AARs. Additionally, regional differences associated with the location in which the data was collected could also differentially affect the findings. Given this limitation, we critically evaluated the psychometric properties of our measures and further analyzed the variance of the measures. All data showed an acceptable level of variance suggesting that participants and crews were heterogeneous (see Table 3). We would expect less variability among participants if the effects of a common organization were inflating correlations. Individual firehouses in this common organization are geographically disparate, and a previous study of this organization found that each crew had its own set of shared norms, attitudes, and overall climate. There is no theoretical reason to believe that the participant's affiliation with the overarching organization had an influence on the specific findings of this study. Future research should consider collecting data across multiple organizations in different industries to improve overall generalizability as well as to further substantiate and verify the current findings.

Conclusion

In sum, our findings indicate that incident ambiguity is one barrier to achieving satisfaction with AAR discussions. However, this study also presents compelling evidence that such ambiguity is more manageable when participants perceive that they may express dissenting points of view. As more organizations seek to increase the reliability of their operations, the manner in which retrospective discussions are facilitated appears to be a promising line of inquiry.

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Dave Murphy retired as Assistant Chief of the Richmond, Ky Fire Dept. He now serves as an Associate Professor of Fire Safety Engineering Technology at the University of North Carolina at Charlotte.

Table 1. Confirmatory Factor Analyses for Discriminant Validity Evidence.

Model	CFI	NNFI	χ^2	df	Difference[a]	RMSEA
One-factor	.74	.70	863.06*	104		.19
Two-factor[1]	.86	.84	549.91*	103	313.15*	.14
Two-factor[2]	.85	.82	602.68*	103	260.38*	.15
Two-factor[3]	.81	.78	520.63*	103	342.43*	.14
Three-factor	.92	.91	279.35*	102	583.71*	.09

Note. N = 119. The one-factor model includes all measures (ambiguity of the call, freedom of dissent, and satisfaction with last AAR) combined. The Two-factor[1] model separates ambiguity of the call into Factor 1 and freedom of dissent and satisfaction with the last AAR into Factor 2. The Two-factor[2] model separates freedom of dissent into Factor 1 and ambiguity of the call and satisfaction with the last AAR into Factor 2. The Two-factor[3] model separates satisfaction with the last AAR into Factor 1 and ambiguity of the call and freedom of dissent into Factor 2; The three-factor model separates each measure into distinct factors. CFI = comparative fit index; NNFI = nonnormed fit index; Difference = difference in chi-square from the one-factor model; RMSEA = root-mean-square error of approximation.
*p < .05.

Table 2. Items, Reliabilities, and Varimax Factor Loadings for Focal Scales.

Scale	Items	Loading
Ambiguity of the Call	I still had some unanswered questions about the call.	.52
	I wasn't sure whether I did my job correctly.	.77
	It was unclear why we were told to do something.	.83
	I wasn't sure whether what I did was effective.	.82
	I was confused about one or more things that happened during the call.	.75
	I was wondering whether I had made a mistake during the call.	.89
	I was wondering whether others had made mistakes during the call.	.65
Freedom of Dissent	I felt I had freedom of speech.	.53
	There was fear of expressing your true feelings about a call.	1.03
	I was hesitant to raise questions or contradictory opinions.	.80
Satisfaction with last AAR	Stimulating	.43
	Boring	.52
	Unpleasant	.53
	Satisfying	.63
	Enjoyable	.55
	Annoying	.65

Note. N = 119. All loadings are standardized. AAR = after-action review.

Table 3. Means, Standard Deviations, Intercorrelations, and Reliability Coefficients of Key Variables.

Variable	M	SD	1	2	3	4	5	6
1. Gender	1.04	0.21						
2. Age	36.08	7.86	−.08					
3. Tenure	10.54	6.68	−.08	.79**				
4. Education Level	3.25	0.72	−.12*	.05	−.02			
5. Call Ambiguity	1.93	0.79	−.14	.18	.17	.17		
6. FOD	4.08	1.06	.11	−.13	−.07	−.14	−.34**	
7. AAR Satisfaction	2.40	0.80	−.07	−.08	.03	.10	−.22*	.30**

Note. N = 119; FOD = freedom of dissent; AAR = after-action review.
*Denotes significance at $p < .05$. **Denotes significance at $p < .001$.

Table 4. Moderated Regression Analysis With Satisfaction With Last AAR as the Dependent Variable.

Model	B	SE	F	R^2	ΔR^2
Step 1			6.94	.107**	
(Intercept)	2.41**	.069			
Call Ambiguity (Centered)	−.12	.092			
FOD (Centered)	.19*	.069			
Step 2			6.24	.140**	.033*
(Intercept)	2.45**	.071			
Call Ambiguity (Centered)	−.10	.092			
FOD (Centered)	.18*	.069			
Ambiguity × FOD	.13*	.065			

Note. N = 119; b = unstandardized beta weight; FOD = freedom of dissent; AAR = after-action review.
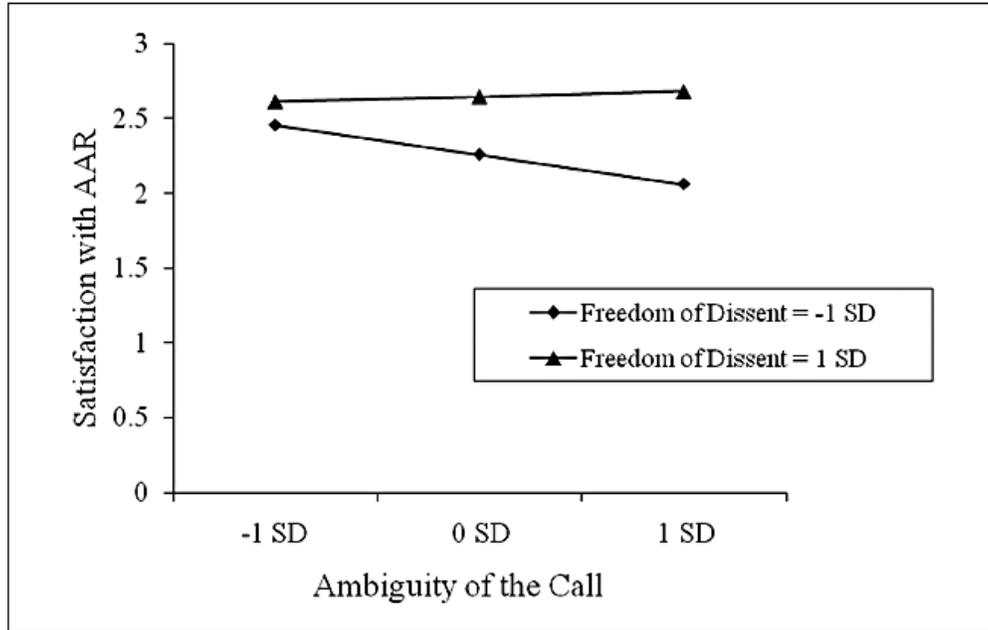*$p < .05$. **$p < .001$.

Figure 1. Moderating effects of freedom of dissent.

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