Learning by doing: Wildland firefighters' stories about their pivotal fireline learning experiences

Jody L. S. Jahn [A]

[A]University of California
4415 SS&MS,
Santa Barbara, CA 93107
jodyjahn@umail.ucsb.edu

Abstract:
This paper explores how wildland firefighters' pivotal fireline experiences help them develop a sense of confidence in their engagement of fireline situations. Previous studies have identified ways that the social environment discourages members from voicing concerns, pointing to ways that social constraints cause organization members to *question their own assessments*. The next logical question, which previous research on wildland firefighters has not explored is: How do firefighters' experiences help them to *trust* their own assessments? This paper explores that question, unpacking how firefighters' previous experiences help them to develop as firefighters, coming to trust their abilities to make sense of ambiguous fireline circumstances, to manage conflicting objectives, and to negotiate the social environment. Findings reveal four story themes that address the research question: 1) Developing a technique for organizing details, 2) Developing a technique for trusting others, 3) Recognizing one's readiness for more responsibility, and 4) Perfecting a reasoning process.

Additional Keywords: High reliability organization, sensemaking

Sensemaking and Stories

This paper explores how wildland firefighters' pivotal fireline experiences help them develop a sense of agency, or confidence, in their engagement of fireline situations. Stories are the verbalized interpretations of the complex and ambiguous environments that organization members face, and they represent how an individual has imposed a system of order onto a situation that was otherwise complex and confusing (Weick, 1995; Weick & Browning, 1986). Stories about pivotal learning experiences are explanations (Labov, 2001, Squire, 2005) that the individual uses as a basis for managing various organizational objectives, navigating through challenging social situations, and identifying hazards in the environment. Stories illustrate the "sense" an individual has already made about circumstances they have encountered. Stories often indicate how the individual plans to draw from their experience when they encounter such opportunities for *sensemaking* in the future.

Sensemaking (Weick, 1995; Weick, Sutcliffe & Obstfeld, 2005) is a process of "ongoing, retrospective development of plausible images that rationalize what people are doing (Weick et al., 2005, p. 409). Sensemaking involves, at the individual level, a scanning of the environment to look for the most meaningful information among numerous cues. A cue is a piece of information the individual recognizes as important, either because they were trained to look for

that information (e.g., changes in weather or fire behavior), or because they discovered its importance in the course of doing the job (Weick, 1995). Individuals *notice* cues from the environment and *bracket* them as potentially important. They *label* the cues according to what they might indicate, and *presume* an explanation of what could be going on. Then they act on the presumption and retrospectively assess the extent to which their presumptions and action fit with the circumstances they encountered. Retrospective assessments guide them to change future assessments and actions if initial responses turned out to disconfirm what they thought.

There are several key ways sensemaking has been explored with regard to wildland firefighting, two of these areas include noticing and bracketing information from the environment, and exploring ways that sensemaking plays out as a social process. First, according to Weick (1995) sensemaking is about noticing and bracketing cues from the environment. This means that individuals are constantly assessing their surroundings for information that helps them decide what to do next. This involves looking for ways their environment gives them a tactical advantage in addition to scanning for things that are or could become problematic. Bracketing refers to grouping related cues together. For example, a change in weather often also means changes in fire behavior. In Weick's (1993) analysis of sensemaking during the Mann Gulch incident, based on Norman Maclean's (1992) *Young Men and Fire*, he contends that the firefighters had the impression that they were going to be fighting a relatively easy blaze. The firefighters referred to the incident as a "10:00 fire, [which is] one that can be surrounded completely and isolated by 10:00 the next morning" (Weick, 1993, p. 635). This initial impression remained unchanged throughout the day, preventing them from taking the time to notice reasonable escape routes, and inhibiting their ability to see that fire and weather conditions in the environment around them were changing in serious ways.

Second, Noticing and bracketing cues may begin as an individual cognition process, but as individuals notice changes in the environment, sensemaking often becomes a social process as individuals talk about changes with co-workers. Through their communication, they construct an explanation for what they are noticing. For example, Barton and Sutcliffe (2009) explored the social sensemaking process among wildland firefighters by exploring their narratives about speaking up in problematic situations. They found that voicing concerns serves to interrupt chains of errors; it slows down the momentum of problematic events. However, they found that lower status firefighters often stayed quiet even when they felt strongly that they should take a different course of action. Exploring the ways that lower status inhibits people from voicing concerns, Blatt, Christianson, Sutcliffe and Rosenthal (2006) explored communication in the hospital environment. There are two important reasons why their findings from the hospital context are relevant to firefighters. The first reason is that a regular part of the job for both doctors and wildland firefighters involves creating order from chaos. Much of their attention is focused on constructing an explanation for the situation based on the information in front of them. Doctors observe a variety of the patient's symptoms and must figure out which ones are most important in pointing to the nature of the problem. Once they determine the likely problem, they can develop a course of action to deal with it. In a similar way, wildland firefighters observe the physical environment looking for information that tells them what the fire is likely to do, which areas may be safe or unsafe, and which factors they should monitor on an ongoing basis. Once they have sized-up the situation, they can decide what to do next. A second reason that hospital and firefighting contexts are similar is because their hierarchical pecking orders involve less-experienced organization members learning from more-experienced members. Barton and

Sutcliffe found that the difference in experience level tended to cause the less-experienced, lower-status firefighters to question themselves. This is the dynamic that Blatt et al. explored between medical Interns and their Attending Physician supervisors in the hospital context. They found that speaking up was not just constrained by status, as Barton and Sutcliffe's findings indicated, their study pointed to several other factors including lower ranking members' beliefs that there is something they can do to mitigate or correct the situation, whether they were confident in voicing a concern, and whether they anticipated that there would be a negative social outcome if they were to say something.

The studies discussed above have primarily identified ways that the social environment discourages members from voicing concerns. These studies point to ways that status differences cause members to resist questioning another member's evaluation of a situation, and they unpack the ways that social constraints cause organization members to *question their own assessments*. This is an important safety concern because firefighting requires that firefighters have an awareness of what is going on around them, the ability to paint a sensible picture of how various factors influence one another (e.g., fire behavior, weather, terrain, etc.), and the confidence to act decisively. Doubting the importance of what one sees can be deadly. Previous studies have revealed important findings addressing reasons why--and circumstances under which--organization members may doubt themselves or choose not to voice a concern. However, the opposite question is equally compelling because it points to ways that firefighters overcome social constraints. This is more than just a sense of self-confidence. Rather, it points to a person's deep belief in the importance of what he or she sees in the social and material environments, and how that is tied to personal experience. So to offer a new perspective, this study focuses on an issue overlooked in previous research on wildland firefighters: How do firefighters' experiences help them to *trust* their own assessments? Exploring this question may help us uncover ways that wildland firefighters' confidence is rooted in their lived fireline experiences. The following research question is proposed:

RQ: How do wildland firefighters' narratives about their fireline experiences reflect how they have developed trust in their own abilities to make sense of fireline circumstances?

Methods

This study involves individual in-depth interviews following a semi-structured interview protocol. I asked wildland firefighters to talk about pivotal fire experiences. Pivotal experiences are those that are particularly memorable because they contain at least one important take-away lesson. I asked them to tell me about pivotal experience that they felt had meaningfully contributed to their knowledge base as firefighters. I told them that a pivotal experience could involve any kind of situation they have encountered as a firefighter, whether it be about engaging with flames, being surprised by something, taking on leadership roles, performing helitack, managing social situations, etc. The most important thing was that they felt the lesson learned from the experience was of critical importance to them. The specific interview question was, "Are there experiences you've had on the fireline, working with helicopters or with other firefighters that you consider to have been pivotal learning experiences for you?" If interviewees had a difficult time pinpointing a story to tell, I asked a more pointed version of the question designed to probe for specific experiences that firefighters associated with specific lessons, "Are

there experiences you relive in your mind, situations where you wish you had done something differently, spoken up, or made a different decision?"

Participants. Participants included 27 heli-rappel/helitack wildland firefighters from two geographically distant crews. There were 15 participants (12 male, 3 female) from the West Fork[1] crew located in Region 4, and 12 participants (11 male, 1 female) from the Manzanita crew located in Region 5. The majority of the interviews lasted between 45 to 90 minutes, depending on participant's levels of elaboration. Four of the interviews were approximately 30 minutes. Of those, two were cut short due to the crew being called to respond to fires,[2] and the other two were shorter due to participants' narrative styles. Many firefighters talked about more than one experience, resulting in a total of 58 narratives about pivotal fireline experiences.

Data analysis. Firefighter's narratives were analyzed using a narrative analysis approach (Labov, 1997; 2001; Labov & Fanshel, 1977; Labov & Waletsky, 1967; Squire, 2005). According to Labov and Waletsky, there are six basic narrative elements: An *abstract* indicates what the story is about. The individual sets up the scene with *orientation* details. *Complicating actions* describe 'what happens next' and are the events that drive the story forward. *Evaluative clauses* refer to what the storyteller sees as the human consequences of an event. The *resolution* is how the story ended. And the *coda* links the story to the present by indicating what the narrator learned from the event, how the event has influenced his or her later actions.

First, I coded each narrative for the six narrative elements. This first step was necessary so that I could then "dissect" and compare the narrative elements of one firefighter's narratives to another's. Second, I sorted the narratives into groups based on the prominent narrative elements present in them. For example, I grouped together narratives in which participants gave extensive accounts of *orientation* information such as detailed accounts of the terrain, weather, fire behavior, etc. Another grouping of stories included those that seemed to be driven by *complicating events* in which the participant was surprised by a decision or mistake made by a supervisor or co-worker, or the participant did not agree with the the group's actions in response to something. Third, I read through the stories within each of the groupings, looking for the ways that the *codas*--or takeaway lessons from the event--related back to the other narrative elements in the stories. From this I further classified the stories into numerous categories of themes. I selected the four themes that most strongly answered the research question. The themes include: 1) Developing a technique for organizing details, 2) Developing a technique for trusting others, 3) Recognizing one's readiness for more responsibility, and 4) Perfecting a reasoning process.

Findings and Discussion

The goal of this paper is to uncover how firefighters' previous experiences help them to develop as firefighters, coming to trust their abilities to make sense of ambiguous fireline circumstances, to manage conflicting objectives, and to negotiate the social environment. The interviews reveal that the majority of the participant's stories about coming to trust themselves followed one of four themes. In order to illustrate the themes and lessons to the fullest possible extent, I have selected one exemplary narrative to discuss in detail for each theme.

[1] Pseudonyms have been used instead of the actual names of crews and participants.
[2] I was unable to follow-up with these two participants because their crew's season ended shortly after my initial interviews with them.

Theme #1: Developing a technique for organizing details

Stories related to developing a technique for organizing details involve situations in which the firefighter takes part in a new task or operation (e.g., learning to rappel, entering a new specialty, figuring out various gear, etc.). They discuss the events by which they encountered the complexities in the environment or task, observed the potential for mistakes with undesirable and possibly major consequences, and described how they devised a way to manage those details.

Ryan (West Fork) talked about his transition from being a "spotter" for helicopter rappelling on a light helicopter to spotting on a medium helicopter. He described how the set-up of the gear is different between the two kinds of helicopters and he explained that the procedures for the rappel operations are completely different too. In order to manage all of the details, Ryan said he came up with his own "system" or technique that made sense to him and that he could remember.

"When I came from [being a rappel spotter] on a light to the medium helicopter, the spotting was a whole lot different, and everything's different in the aircrafts. I started immediately, like when I got here, they started putting me through their spotter training here. And just watching the spotters, how they loaded the machine, checked how their folks' loaded machine, which side they started on, which side they finished on. And I basically watched all those guys and then I built my own way of how I do it. So that helped me become a better spotter and then figure out my system, which works for me when I'm checking them, loading them in the aircraft, and then checking everything in the aircraft. So yeah, I learned a lot by just watching."

Ryan's technique helped him remember the numerous details associated with the rappel configuration and procedures. His system allowed him to observe other spotters and model specific behaviors. Modeling their behaviors helped him to remember the numerous details associated with the rappel configuration and procedures. Also, because he was familiar with the specific techniques and steps that other spotters used, he felt his system of carefully watching others functioned as a check on the system.

"If I'm in the back and somebody else is spotting, one of the other spotters, I know my system, and then I'll watch theirs, and it is so close. It is very close. There are tiny little differences between all of us. Knowing my system and then watching theirs, it helps me see if maybe they forgot something. Or vice versa, if I forgot something, they can catch it…I do everything my way, in a way that works for me. Because then I don't second-guess myself. If I deviate from the way I do things, then I'll start second-guessing myself, and then I start thinking I may have missed something. And then it just starts snowballing in my head, and it just throws me out of whack in a hurry."

For a highly complex and tightly-ordered procedure like heli-rappelling, it is important for spotters not only to know what they are doing, but also to know that they can *trust* what they are doing. Ryan's technique for managing the complexities and procedure of spotting for rappels is rooted in his own logic—a logic that makes sense to him. While other spotters may approach the activity differently than he does, Ryan knows that he can trust his own technique in addition to potentially catching errors that other spotters make.

Theme #2: Developing a technique for trusting others

Stories related to *developing a technique for trusting others* involve situations in which a member describes a situation in which they took for granted their trust in another firefighter (usually a supervisor) who surprises them by making a "stupid" mistake. From this type of incident, the individual devises a set of criteria to use in the future when evaluating the trustworthiness of others.

Carly (Manzanita) described an experience from her first fire season working on an engine. In it, she observed her foreman making an elementary mistake.

"The first fire I ever responded to on the engine was on [an island] and we rode out there on a hovercraft. But we were told in briefing, in order to get on these hovercrafts, everything [on the engine] had to be closed down: doors, windows, *all* the doors. Everything had to be zip tied down because these props on the back of these things are so strong they can literally suck the doors off of Humvees."

Carly described how the instructions for safely loading the engine onto the hovercraft were very clear and explicit, and the dangers associated with not following the instructions were also very clearly stated. Because of this, she was surprised when her engine captain made a mistake that endangered the operation of the hovercraft.

"And so it was about 4:00 in the morning. We're going out, and all of a sudden my captain grabs his door. And it won't stop, it won't stop shaking. He's like, 'oh my God. We're going to lose the door.' And so he has us turn on the lights and sirens. And [military hovercraft operators] stop, and they come over. And they're like, 'what's wrong?' And he's like 'I didn't have my door closed all the way.' And the [military] guy was like, 'you don't know how to follow directions?' But to me it was like, wow. To me it was weird, because in fire I had never seen my overhead make a mistake that could have been multiple millions of dollars worth of damage. Here we are going out to our very first fire, and now I'm going 'okay, do I trust him?'"

Carly said this was the first time she had seen a supervisor make such a potentially catastrophic mistake. She described her reaction to the mistake as partly about recognizing that the captain is human, and therefore, fallible. But she also said that her reaction to that mistake affected her in a much more far-reaching way because that incident caused her to question her trust in every person with whom she works. As a result, she recognizes that everybody is fallible, but she feels she can mitigate for that fallibility by trying to understand how people think, and whether she can follow their logic in whatever task they may be performing.

"And it's just one of those things that your supervisors are fallible and trust is a fragile, it can be a very fragile thing. But for me, coming into it from a different perspective, I just thought they were all super heroes and I just do whatever they say and it's totally okay. [But after that experience] it's kind of like oh, maybe I need to think about it first." [That experience] helped me to probably develop a method for me to learn to trust people. And it's not just with supervisors. It's also with other new employees, new seasonals. And it's just one of those things where it takes me a little bit longer to figure them out and figure out: do I trust this person's thought process? Do I trust this person's logic? It's the whole process behind our lookouts that we have up on the hill: Who do you want there? Somebody that you trust, that's experienced, that you trust their logic, you trust them to know when it's time to go before it needs to be something that becomes necessary."

Further, Carly goes on to say that being able to size-up the human dynamics of the people she works with was a somewhat surprising component of firefighter safety.

"My entire first year in fire was about working relationships—how crucial those are to functioning efficiently…learning the different mechanics of different people and being able to identify potential issues or preventing unnecessary chains of reaction."

Stories like Carly's that address the human dynamics of firefighting are important because the firefighters who tell these stories often express a sense of surprise at just how important their working relationships--the types of interactions they have with other firefighters--

are to their safety. While there has been an increased focus in recent years on training firefighters to recognize "human factors," firefighters' stories still reflect a sense of wonder that sizing-up the people they work with is just as important as sizing-up the conditions they face on a fire. This story theme, *developing a technique for trusting others,* highlights an additional way the firefighters come to trust themselves in fireline circumstances. By recognizing that human interactions greatly contribute to fireline safety, firefighters are able to devise ways to mitigate for potential hazards that result from their working relationships. Carly's story demonstrates the specific way she goes about evaluating her relationships: She observes others to see whether she can trust their "thought processes" and prevent "unnecessary chains of reaction."

Theme #3: Recognizing one's readiness for more responsibility

Stories related to this pattern involve a transformation in how individuals see their responsibility or role in a situation. These stories tend to involve members seeing themselves as more experienced than they previously thought, or they realize they are ready to assume a higher level of authority or responsibility under similar future circumstances.

Stuart (West Fork) described a fire experience in which he was working with a module of members from his own crew on a particularly active fire. He observed the conditions and decided on a plan that seemed to make the most sense. He was one of the least experienced firefighters on his crew and encountered resistance from another more experienced crewmember. Through this story, he started to see himself less as a newcomer and more as a firefighter who has valuable experience and ideas. Stuart began his account by describing the terrain, fuel, fire behavior, and his "instinct reaction" to the situation.

"We got to this section of brushy, thick stuff. The fire had kind of stalled out in there--there's probably leaf litter in there; it's going to punk around for a while. And there was a 50-foot swathe, 100-foot swathe of grass on the other side of it. And that didn't really connect to a whole lot, but you never know. As the three of us got to that area, my instinct reaction was, we need to burn that [swathe of grass] out. There's about a 100-foot long section of brush, and it's pretty thick. So there's no reason for the three of us to get in there and try to handle it. We should just cut it off [by burning the grass] and be done with it and have this big nice black buffer between [the brush] and the line."

Stuart was excited about his plan to burn the swathe of grass because it meant that the three-person module would not have to lose time by becoming entangled in a patch of brush. His plan made the most logical sense to him. However, it was a bold plan, one that is typically suggested by firefighters higher in the chain-of-command or with more fire experience than he had at that time.

"And we debated about it in our little module. I don't have any hotshot experience, so I don't have a whole lot of experience with big fire, a little bit, but not a lot, not certainly, as much as them. But I have been in roles where I've been making those kinds of decisions more, being right next to the engine boss or the squad boss or whatever or the manager when they're discussing their options and thinking about their decision. And so I feel like there was one guy [with hotshot experience] that was kind of resistant to that. He was like, 'you just want to burn stuff.' I'm like, 'well, yeah, kind of, but it's also the easiest way to deal with it.'"

Stuart explained that even though he encountered some resistance from a more experienced crewmember, he was adamant that his idea to burn out the swathe of grass made the most sense under the circumstances and sought a second opinion from a respected crewmember who was working adjacent to them on the fire.

"I ended up talking to [a more experienced crewmember in a higher level of command] and kind of mentioned it, painted the situation for him. He's like, 'well, if you guys need to burn it off to get it done, do it.' I was like, 'yes, thank you.' Because it verified what my initial reaction was and was the easiest option."

Stuart goes on to say that this experience showed him that he has reached a point in his fire career where he sees himself and his fire background as being more valuable than he previously had thought. He says that even though he's relatively new to fire and has not worked on a hotshot crew (like many of his fellow crewmembers have) where he would see more "big fire," he is beginning to see that he does have quality experience and valuable insights to offer.

"The lesson I took home was that I need to forget sometimes that I haven't been on a hotshot crew. That weighs on me a lot of times. I let that shape my confidence in myself and my decision-making and also just the fact that I've only been in fire for four years, and most people I've worked with have been in for more than that, typically, and with special crew experience, most of them. So anyways, it helped me understand that I need to be the stronger voice--to say: I know this is what we need to do. This is the right way to do it--not cram it down their throats--but be a little bit more strong, less passive."

Stuart's account illustrates an important transition in how he sees himself. Through this experience he realizes that he no longer sees the fire environment through the eyes of a newcomer. Rather, he is beginning to assess situations from the perspective of a knowledgeable firefighter. This is an important transition to examine because wildland firefighters' career paths vary greatly from one person to the next. Even though all firefighters ultimately manage the same fireline hazards, they must first become acquainted with the realities of those hazards--what they look like, how they play out. They must see the strategies and tactics enacted to deal with fireline conditions and situations, which are managed in different ways depending on the crew's specialty and that specialty's capabilities (e.g., engine, hotshot, helitack, etc.).

Also important is that Stuart indicates his impression that experience in some specialties is considered to be more valuable than others. Stuart's primary background had been working on an engine, and in his story, he indicates that his lack of hotshot experience has made him question himself. Specifically, he sees his assessment of a fire situation--as someone with primarily engine experience--as less valuable than assessments by those with any amount of hotshot experience. Stuart's story illustrates an experience in which he overcame that perception and saw that he did not need to question himself. This is because, from that particular experience, he was able to devise a strategy, test it, and see that it worked well with the fireline conditions.

Theme #4: Perfecting a reasoning process

Stories related to *perfecting a reasoning process* involve situations in which firefighters describe the environmental conditions in detail, including fire behavior, weather, terrain, and tactical moves. They explain their initial assessment, and describe how their resulting plan made the most sense given the circumstances. Through the course of the narrative, one or a few key events occur, which require a change in plans, and cause them to reconsider the importance of some of the initial conditions they encountered. Nearly every story in this theme related to escape routes and safety zones that turned out to be inadequate. Since most of the stories were about identifying escape routes and safety zones, the focus is on how the individual assesses the fire environment. The role of the social environment also is present but it is less obvious. Instead

of referring to specific social interactions, the participants talked about their use of standard procedures (e.g., 10 Standard Firefighting Orders, 18 Situations that Shout "Watchout," etc.). What makes these standard procedures social is that firefighters talk about the typical ways their crews go about implementing these safety precautions. These narratives are particularly memorable for firefighters because they are instances in which they felt they took all of the precautions typically accepted as their crews' normal ways of implementing safety, but they still ended up in unsafe situations.

Paul (West Fork) described a situation in which the primary objective was to cut a helispot for a large helicopter. He has identified 'Lookouts, Communications, Escape Routes, and Safety Zones' (LCES), and an increase in fire behavior later in the day causes them to retreat to their safety zone via their escape route. Through this process, Paul recognized that helitack sometimes involves managing both firefighting and helicopter safety, the objectives of which sometimes conflict. In recognizing this, he hones his reasoning process in order to account for the decisions he has made and anticipates how he would manage competing priorities in the future.

"[We were] cutting out a helispot for a Type 1 aircraft. Going into it, flying over the fire, we saw that there's not a lot of activity on the fire and [were] thinking that, oh, this is a fine spot. We're not in the black, but the black is ten minutes distance away, so if something is to happen, we can hike out of it, hopefully, fast enough to get to a safety zone, and having a lookout also readily available. So I guess with that situation, I mean, everything seemed normal."

In addition to establishing an escape route and safety zone, Paul described that he also had a lookout and communication in place, completing the LCES requirements for safe fireline operations. He indicated that the situation they encountered and their plan to mitigate hazards was similar to what they usually do—it was a "normal" situation.

"So as we were cutting out the helispot, we had one person that was on the radio, which is pivotal. So while two chainsaws are running, obviously, you can't be listening to your radio as you're running your chainsaw. So there was somebody there that was managing the radio, and they got a call, not from our lookout, but from a hotshot crew. They were saying activity was picking up, and the fire was coming our way, and we should look at getting out of there."

Paul goes on to say that the safety precautions they put in place were based on their view of a relatively inactive fire earlier in the day. Even though they had LCES in place, their plan did not account for the severity of conditions they were to experience later in the afternoon, conditions they may have known about had they had the opportunity to observe the fire behavior during previous burn cycles over the previous days.

"It was our first few days actually going out on the fireline. We hadn't been out, I don't think, the day before, so we hadn't seen what the activity is like at certain hours of the day, and perhaps, if we had known what it's like, say, at 1300. I think the fire had been doing that continuously every day at a certain hour, really picking up. Because from our perspective, when you looked over the fire as we flew to where we were going, everything was dead, and there were just little bits of smoke. [We didn't expect it to] immediately turn into a huge, giant column coming towards us. So I guess that's the big thing to learn is just always be ready, have your safety zone prepared and your routes to getting there, and make sure that you can make it within the time, based on what you think could come your way, and always have lookouts."

Paul's takeaway lesson from this experience was to make sure that escape routes and safety zones were not only in place, but also useable. This may seem obvious, however, Paul's account highlights his routine way of providing for LCES, and the lesson from his story points to an important assumption underlying this routine. The assumption is that having an escape route and safety zone *in mind* is enough. The lesson he took from the experience is that it is not enough to simply identify an escape route and safety zone; firefighters must do so with the expectation that they may have to use them. Further, Paul's account points to the added complexity of managing helitack objectives in addition to firefighting objectives.

"The idea was to have the helispot outside of the black, because it was a flatter area, and with a Type 1 aircraft, they're usually wheeled, and they need quite a large area to land in. And the slope was an issue with most of the spots in the black. And so in this instance, it was probably better just to stick with [standard procedure], have it in the black, and that way you wouldn't run into the risks that we obviously ran into."

Paul's objective, first and foremost, was to cut a helispot that would be safe for landing a very large helicopter. However, the safest landing zone was in an area of unburned fuel, which compromised his safety. Knowing that this was the case, Paul mitigated for the added hazard of working in unburned fuel by ensuring he had deliberately accounted for LCES. His reasoning reflects that he managed both helitack and fireline objectives, but privileged the helitack objectives because they were of the most immediate concern when initially devising the plan.

Paul's example is a useful illustration of the conflicting objectives that firefighters often encounter. While the fire environment poses any number of dangers, working with helicopters poses an entirely different, and added, set of dangers that are just as potentially lethal. Paul's story highlights his reasoning process--how he defends, justifies and critiques the reasons why his decisions did (and did not) work in this circumstance. Paul's story of how he reasoned through his decisions enables us to see the ways that one compelling set of objectives (e.g., building the safest possible helispot) sometimes conflicts with other equally compelling objectives (e.g., maintaining a safe proximity to the black). His story allows us to see how he observed the conditions, and chose one line of logic to follow, a logic that put helitack safety concerns in the forefront. He then developed a plan, mitigated for safety, encountered unexpected fire intensity, and was then forced to prioritize fireline safety guidelines. From this event, he ultimately developed a wider understanding of potential dangers he must consider in his reasoning process in the future as he balances helitack and fireline safety.

Conclusion

These stories illustrate types of 'slides,' a term wildland firefighters often use to refer to memorable experiences of enacting the tasks of firefighting. As a result of their 'slides,' firefighters talk about coming to deeper understandings of fireline situations and reflect on ways to act knowledgeably and decisively in the future. Their 'slides' become the foundation on which they build a sense of trust in their enacted experiences. The four story themes identified above illustrate key dimensions for the ways that wildland firefighters come to trust themselves by developing techniques for managing details, evaluating other firefighters' logic and thought processes, recognizing the value of their previous experiences, and perfecting the ways that they have made sense of fireline experiences through reflection on the ways they fulfilled various objectives. Firefighting is ultimately a social process that plays out in an ambiguous and complex environment. As Barton and Sutcliffe (2009) note, one mechanism for maintaining reliably safe

operations includes firefighters voicing their concerns. This interrupts chains of errors and forces firefighters to re-evaluate their observations and decisions. However, this process is inhibited when firefighters are not able to trust the importance of their experience—when they doubt their assessments. The story themes presented in this study extend Barton and Sutcliffe's work by highlighting the kinds of experiences that have helped firefighters to trust themselves as knowledgeable contributors to firefighting processes.

References

Barton, M. A., & Sutcliffe, K. M. (2009). Overcoming dysfunctional momentum: Organizational safety as a social achievement. *Human Relations, 62,* 1327-1356.

Blatt, R., Christianson, M. K., Sutcliffe, K. M., & Rosenthal, M. M. (2006). A sensemaking lens on reliability. *Journal of Organizational Behavior, 27,* 897-917.

Labov, W. (1997) 'Some further steps in narrative analysis', http://www.ling.upenn.edu/wlabov/sfs.html

Labov, W. (2001) 'Uncovering the event structure of narrative', in *Georgetown Round Table*. Georgetown: Georgetown University Press.

Labov, W. and Fanshel, D. (1977) *Therapeutic Discourse: Psychotherapy as Conversation.* New York: Academic Press. Labov, W. and Waletsky, J. (1967) 'Narrative analysis', in J. Helm (ed) *Essays on the Verbal and Visual Arts.* Seattle: University of Washington Press.

Labov, W. and Waletsky, J. (1967) 'Narrative analysis', in J. Helm (ed) *Essays on the Verbal and Visual Arts.* Seattle: University of Washington Press.

Maclean, N. (1992). *Young Men and Fire.* University of Chicago Press.

Squire, C. (2005). Reading narratives. *Group Analysis*, *38,* 91-107.

Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly, 38,* 628-652.

Weick, K. E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.

Weick, K. E., & Browning, L. D. (1986). Argument and narration in organizational communication. *Journal of Management, 12,* 243-59.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 16*, 409-421.