

# Agentive Language in Accident Investigation: Why Language Matters in Learning from Events

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**ABSTRACT:** Language can hinder or facilitate the ability of an organization to learn from events. Language has a strong influence on the assignment of causality, particularly when it is used to identify humans as the agents of action. Research has shown that the ascription of agency to an event is subjective and affected by the culture, biases, and spoken language of the observer. This paper suggests that linguistic framing and shortcuts can affect many aspects of accident investigation and, in some instances, may lead to undeserved blame and punishment of assumed human agents. This may create an artificial stopping point for inquiry, which can affect the ability of an organization to learn from events and create a safer working environment.

**KEYWORDS:** *agentive language, learning from events, causality, biases, linguistic framing, human factors, accident investigation, binary opposition, active voice*

## ■ INTRODUCTION

Humans naturally want to know who or what was responsible for an action, especially if it led to an undesirable event. This assignment of action is called *agency*. An agent is “A person or thing that takes an active role or produces a specified effect”.<sup>1</sup> In the example, “Bob spilled the chemical”, Bob is the agent of the action. However, the simplicity of this sentence does not tell us whether Bob spilled the chemical intentionally, by accident, or was just near the chemical when the event occurred. We likely assume that the agent of the action acted independently and made a free will choice to act. This assumption can make all the difference when we are attempting to learn from the event and influence how we create safety in our work environment.

Assigning agency to an accident can have far reaching effects. Research has shown that the ascription of agency is subjective and is influenced by the culture, experience, and language of the observer. Linguistic framing of events has been shown to directly affect the assignment of guilt, blame, and punishment of human actors. This framing can also directly impact how an organization learns from events, especially when represented in written accident reports. The language of accident reports plays a role in identifying agents and linking them to events. Linguistic short cuts and biases can reduce the understanding of context around an accident, which can artificially stop the learning process and lead to a false sense of improved safety.

Language does not stand alone in influencing our attitudes and actions toward causality; however, it has a strong effect on how safety is approached and defined. Organizations are faced with a critical choice, to assign blame and punishment to the human closest to an event, or to learn everything possible from the conditions and influences surrounding an event so that real changes to the environment, organization, and culture can be made for long lasting improvement. Language can help determine the direction of this choice.

## ■ ERRORS AND BIASES: THE CHALLENGES OF ASSIGNING AGENCY

From an evolutionary perspective, humans have a need for agency when it comes to predicting the actions of others, which impacts our safety and ability to survive.<sup>2</sup> Agency is critical to our culture, society, and worldview, yet the ascription of agency has been shown to be subjective. “What it means to be an ‘agent’ does not appear to be a stable, universal property of events in the world. What people see and believe to be an agent is constructed in context.”<sup>3</sup> In the 1950s, Gestalt psychologist Fritz Heider pioneered the idea of *attribution theory*, or how we explain the behavior of others and ourselves. Heider suggested that behavior can be attributed either to a person’s internal characteristics or disposition (personality, abilities, mood, attitude, motivations, efforts, beliefs, ...) or to the forces outside of them (culture, social norms, peer pressure, help from others, organizational rules, environmental events, luck, ...). “When we observe someone acting intentionally, we sometimes attribute that person’s behavior to *internal* causes (for example, the person’s disposition or mental state) and sometimes to *external* causes (for example, something about the person’s situation). A teacher may wonder whether a child’s underachievement is due to lack of motivation and ability (a dispositional attribution) or to physical and social circumstances (a situational attribution).”<sup>4</sup>

There are many influences on how a person may assign agency. Our decisions and actions around an event will be dependent on both the situational context and what we, ourselves, bring to it from our internal state and past experiences.

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These can lead to the judgment of actions as errors, which may reflect biased views toward the potential agent. One example is the *fundamental attribution error*, where observers underestimate the external/situational influences on another person's behavior and overestimate the dispositional/personality-based influences. "When explaining someone's behavior, we often underestimate the impact of the situation and overestimate the extent to which it reflects the individual's traits and attitudes."<sup>4</sup> This makes it easier to judge a person's negative actions as coming from their own volition and disposition.

Cultures have been found to assign agency differently, based on their values. People from Western societies like Anglo-America and Anglo-Saxon Europe tend to have individualistic beliefs that value independence and personal goals. People from Eastern societies, like Asia, have more collectivist views that value working together, conformity, and interdependence.<sup>3</sup> These world views affect if a person will place more value on the situational influences of an event, or on the dispositional/personality-based influences, which can preload meaning into the analysis of an event. Western societies are more inclined to make fundamental attribution errors that place the decision and control of an action on the actor. "Compared to people in interdependent societies, people in independent societies are more likely to select a single proximal cause for an event."<sup>3</sup> The selected cause is usually attributed to the human actor closest to the event.<sup>13</sup>

In a Western society, we are likely to identify a person other than ourselves as the agent of an action, particularly if the outcome was negative. When we look at our own acts, however, we typically associate ourselves with success and distance ourselves from failure, which is referred to as *self-serving attribution bias*.<sup>4</sup> If the event led to positive consequences, like succeeding in a job interview and getting the position, we ascribe the agency to our own internal ability; e.g., "I succeeded because I am a good communicator and am capable at the tasks." If we did not get the job, the cause will likely be placed on external conditions seemingly outside our own power; e.g., "I was not hired because the interviewer was distracted with a phone call and did not pay attention to my capabilities."

Our self-serving attribution bias escalates when we are exposed to undesirable events, like accidents. These situations can trigger a *defensive attribution bias*, which influences people to defend themselves from the concern that they will be seen as the cause, or the victim, of a mishap. "If we can categorize a serious accident in some way [as] the victim's fault, it is reassuring. We then simply need to assure ourselves that we are a different kind of person from the victim, or that we would behave differently under similar circumstances, and we feel protected from catastrophe."<sup>5</sup> The accident can, therefore, be seen as controllable or preventable. As Burger suggests in his meta-analysis of defensive attribution, "When observers were personally and situationally similar to the accident perpetrator, they tended to attribute less responsibility to the perpetrator when accident severity increased. The opposite was found to be the case when the perceiver and the perpetrator were dissimilar."<sup>6</sup> Blaming someone other than ourselves for different internal traits helps us to take ourselves out of the equation and feel safe again.

## ■ LANGUAGE AND HUMAN CAUSAL ATTRIBUTION

The construction of agency is riddled with the complexity of our experience, culture, and perceived need for control over our environment. Our choice of cause is dependent on both the physical and social contexts that surround the event. All of these

factors come together in our use of language, which helps us interpret, construct meaning, and communicate with others. Research has shown that even simple linguistic changes to the description of an event can affect how we assign agency to it.<sup>3</sup> However, most of our own agentive language variations are invisible to us—we rarely see the change to our words, or the actions that result from them.

Most people would agree that there is a difference between an intentional act and an unintentional event (an "accident"). An accident is defined as "An undesirable or unfortunate happening that occurs unintentionally and usually results in harm, injury, damage, or loss; casualty; mishap."<sup>7</sup> However, we often use the word "accident" to refer both to unintentional acts and those we deem intentional. For example, we still use the label "car accident" when we believe the driver was at fault. This default to an agentive term confuses the understanding of the event and can lead to unintentional consequences in the case of drivers who were not at fault. Language can be used to give an extensive description of an event, including the explanation of the event environment, which includes context, conditions, and other elements that impacted the outcome. However, we rarely do this; rather, we use linguistic shortcuts to communicate complex ideas. If the audience is similar to us (such as family or co-workers), we may unconsciously assume that they will interpret our words with the same meaning that we have ascribed. The fewer words we use to describe an event, the more likely the misinterpretation of our meaning. This becomes extremely important when accident reports are written, as will be discussed later in this paper.

Many chemical health and safety professionals work in environments where the English language is used. English speakers have been shown to exhibit an agentive bias that may affect how they represent events, which could impact accident analysis. Linguistic research has shown that English speakers are more likely to use agentive descriptions for all events, as compared to some other language speakers. In one study, English and Spanish speaking participants viewed videos of actors in an event that could be interpreted as either nonintentional or intentional and then provided verbal descriptions of the events. For example, an actor would pop a balloon using a tack (intentional). Alternatively, the actor would reach to put a tack in a container and the balloon would pop during the reach (nonintentional). The participant descriptions were coded as being either agentive or nonagentive. An agentive description would be something like, "He popped the balloon." A nonagentive description could be, "The balloon popped." The study concluded that English, Spanish, and bilingual speakers described intentional events agentively, but English speakers were more likely than the other groups to use agentive descriptions for *nonintentional* events.<sup>8</sup> Another study showed similar results between English and Japanese speakers.<sup>3</sup>

Further studies were done using *language priming*, which exposed participants to agentive language ("He crashed the car") or nonagentive language ("The car crashed"). English speakers who had heard the agentive language remembered actors better than those who were exposed to nonagentive language. This may confirm a link between language and memory, which could play a role in eye-witness accounts of accidents. "Placing attention on individuals involved in accidents may improve memory for those individuals, but it may also undermine memory for other details of the situation or context and may invite undue punishment (or undue reward in the case of positive accidental outcomes) on those who were not acting intentionally."<sup>3</sup> In addition, a

linguistic meta-analysis of London's central criminal court examined 197,745 criminal trials held between 1674 and 1913 and found that the use of agentive language priming resulted in more guilty verdicts.<sup>9</sup>

These studies show that agentive biases can be hidden in cultural artifacts of the language we speak and are also influenced by language priming. More research is needed on the relation of language to the ascription of agency. Safety managers depend on event descriptions in daily safe practices, where workers share knowledge of their experiences, and also for accident analysis. Noting the existence of these biases can help safety professionals monitor their own potential influences, as well as those of others.

## ■ THE LANGUAGE OF ACCIDENT INVESTIGATION

When an accident happens, organizations often struggle to find a cause, remove it, and theoretically reestablish safety in the workplace. Accident investigators are still heavily influenced by accident models that were developed a century ago, including H.W. Heinrich's "behavioral-based accident model" which said that 88% of accidents are caused by humans through their unsafe acts, 10% are mechanical or physical conditions, and 2% are unpreventable. Heinrich believed that human acts were the most important factor in accidents, "In the occurrence of accidental injury, it is apparent that man failure is the heart of the problem; equally apparent is the conclusion that methods of control must be directed toward man failure."<sup>10</sup> Though there have been other accident models over the years, evidence of this model pervades accident investigations and organizational safety literature to this day.<sup>13,14</sup> The scale and the descriptive words encourage organizations to place a higher weight on human error (fundamental attribution error) and adds to the natural bias of placing blame outside oneself (defensive attribution bias).

In addition, Heinrich's theory sets up a choice between two causes: unsafe acts and unsafe conditions (he essentially drops the "unpreventable 2%"). Our world is filled with rich language to describe our experience; however, humans are driven toward simplifying their language to help them quickly explain and understand their world.<sup>11</sup> This need for linguistic shortcuts can lead to the use of binary oppositions, where pairs of terms are seen as polar opposites (right/wrong, success/failure, good/bad, ...). This "either-or" thinking can limit possibilities so that problems can be perceived as solvable in a timely manner. The structuring of written text by binary opposition can also influence the reader to value one side over the other.<sup>12</sup> Given Heinrich's two choices with strong binary weight on human acts, an accident investigator would be hard pressed to come up with a choice other than human agency.

A further binary linguistic separation occurs as we talk about "success" and "failure" in safety. The concept of failure is rooted in theories surrounding simple or complicated machine systems, which have a limited number of parts that can break.<sup>13</sup> Technological systems function in a bimodal manner, they either function or they do not (think of a light switch turning on/off). These systems can be taken apart and put back together, with an expectation that they will function the same way. Humans are different and inherently complex, with dynamic and emergent cognition and a unique ability to learn. The social nature of human interaction also leads to uncertainty and unpredictability. We can really only say that a human "failed" or "succeeded" in hindsight, once the outcome of the action is known.<sup>24</sup> However, the agentive language that we use for machines is often used to describe human action.

One place where damaging agentive language can be found is in accident investigation, particularly in the written reports and the instruction guides that influence the analysis team. Let us look at an example of an accident investigation guide, which influenced one of the largest U.S. federal agencies for many years and resulted in reports that contained biased and agentive language. In *Language Bias in Accident Investigation*,<sup>14</sup> the author examined the effect of the U.S. Forest Service Serious Accident Investigation Guide (SAIG)<sup>15</sup> and found that linguistic framing, priming, and shortcuts in the guide led to agentive descriptions in accident reports. These reports negatively impacted fire-fighters, personnel, and leadership for decades. The goal of the SAIG was stated to be accident prevention, yet the number of serious accidents in the Forest Service increased during the years this guide was used.<sup>16</sup>

The first paragraph in the Serious Accident Investigation Guide states, "The causes of most accidents or incidents are a result of failures to observe established policies, procedures, and controls."<sup>15</sup> This language presupposes that the cause of accidents is human failure. Though the guide goes on to develop three categories of "significant findings", human, environmental, and material, only humans can meet the condition of *failures to observe*. The SAIG repeats the word "failure" 91 times in its guidance for investigators, particularly in regard to humans. It is not surprising that the word "failure" also appears multiple times in resulting accident reports to blame human action. The guide also includes a taxonomy for judging human factors, where it states, "Human factors play a large role in most accidents."<sup>15</sup> The guide glossary adds to the binary division, "A causal factor may be related to persons or machines."<sup>15</sup> All of these examples reflect language priming for investigators. Language priming, or *structural priming* as referred to by Bock, is a form of repetition that may reflect learning and development, imitation, and lack of executive control. "When people talk and write, they tend to repeat the underlying basic structures that they recently produced or experienced others produce ... Repetition is also inversely related to creativity, in that when we repeat a previous behavior, we forgo the opportunity to create a novel behavior instead."<sup>15</sup> If accident investigators are instructed to look for a specific source of agency, they may not be open to other contextual elements of the event which lie within the network of influences. This may lead to simplistic descriptions of accidents and their causes and ineffective "fixes" for safety problems.

The SAIG tries to distract from its own priming language by stating that only "factual data" should be used for evidence. Interviews are to be conducted to find facts, "Explain that the interview is for accident prevention and that you are only seeking the facts related to the accident."<sup>15</sup> Facts should lead to findings, "When possible, findings should be supported by two or more facts discovered during the investigation."<sup>15</sup> According to the guide, a "fact" is reality or actuality, which implies that there is always an objective, knowable, and *unbiased* state of the world. As shown from the research on agency and language, it is unlikely that a single, objective story exists around an event. Memories, experiences, and language will differ when an event is retold, and written descriptions will be subject to linguistic bias and shortcuts.

Accident investigators often believe that first-hand facts are an objective way to create a narrative. "One way of warranting a report as factual is to describe events as ones that are directly perceived, or by means of graphic description and sequential narrative, that imply or invoke the perceptual clarity of being

there.”<sup>17</sup> However, language priming still plays a role in first-hand accounts. This was made evident by a study of the well-known “Super Bowl” half-time show of 2004, where performers Justin Timberlake and Janet Jackson ended their musical act with a “wardrobe malfunction” (Janet Jackson’s breast being exposed on U.S. national television). Research participants read either an agentive description of the event (“In this final dance move, he unfastened a snap and tore part of the bodice!”) or a nonagentive report (“In this final dance move, a snap unfastened and part of the bodice tore!”).<sup>3</sup> Some participants also watched the video before or after being given the written description. Results of the study showed, “Linguistic framing not only influenced attributions of blame, but also influenced assessments of financial liability. In the case of the wardrobe malfunction incident, an agentive report led people to think that Justin Timberlake owed more than \$30,000 more (an extra 53%) in fines compared with a nonagentive report. In real-world contexts, visual evidence of accidents is rarely presented in the absence of linguistic framing. These results suggest that the form of this framing guides punishment.”<sup>3</sup>

Small differences in language can have a large impact on causal attribution, with the sentence structure influencing how a reader perceives causality of the event. The *active verb voice* is one impactful linguistic technique that can lead to the assignment of agency. When a verb is presented in the active voice, the subject is seen to be *doing* the action, as in “Sara hit the ball.” Here, Sara is the subject of the sentence in relation to the ball. The passive verb voice would structure the sentence more like this, “The ball was hit.” Research has shown that attributions of control, causation, and dominance are all affected by the verb voice, even if an agent’s actions are presented as nonintentional.<sup>18</sup> “Active voice apparently conveys a sense of control and causation that is lacking in the passive voice.”<sup>19</sup> The Serious Accident Investigation Guide tells investigators to specifically use the active voice when identifying causal factors. “Write causal factors in the active voice, clearly identifying the actor(s) and causal action, along with any necessary explanation.”<sup>15</sup> According to Au’s research on the relation of interpersonal verbs to the causes and consequences of events, “The cause of an interpersonal event ... is attributed to whoever is presupposed in the verb to be responsible for the situation that led to the event.”<sup>18</sup> The direction of the SAIG to specifically use the active verb voice almost guarantees that causal attribution will be placed on the human actors in an investigation. Indeed, upon the author’s review of dozens of investigations completed by the U.S. Forest Service and other agencies using versions of the SAIG (Bureau of Land Management, Bureau of Indian Affairs), human agency was found as causal in most accidents. This occurred even in cases when humans were not acting on the environment, such as when wildland firefighters were simply walking through the forest and were struck by falling tree branches.<sup>20</sup>

On the same page as the instruction to use the active voice, along with any necessary explanation, the SAIG also insists accident investigators use an “economy of words” to describe significant findings. “Do not include any more information in each finding than is necessary to explain the event occurrence.” Cognitive psychologist David Woods calls these linguistically shortened concepts, “labels that masquerade as explanations”, and says that a label is not an explanation, in itself.<sup>21</sup> Complex concepts do not stand alone but are a result of social and psychological processes that assign the status. These labels are apparent in any investigation system that uses taxonomies to categorize human factors. Taxonomies are known to use limited

words (cognitive and linguistic economy) to describe categories of failure. The 2005 version of the SAIG includes the Human Factors Analysis and Classification System (HFACS), a taxonomy developed by Shappell and Wiegmann to investigate and analyze human factors in U.S. Air Force aviation.<sup>22</sup> This taxonomy divides human error into a binary choice of two “unsafe acts”: error or violation. The labeled “acts” presuppose agency of a human actor in both cases. The further binary choice of “error versus violation” presents investigators with only two causal attribution frames by which to describe the human action. The causal categories are limited and incomplete, with no guidance for understanding the actions of the accused, the network of influences, or the context inherent in the event.

The combined direction of the SAIG that demands the use of active voice and an economy of words can result in agentive labels replacing context in accident reports. This absence of information limits the learning that could be achieved through the investigative process. “Our words bring facts into being (e.g., ‘the pilots’ failure to ...’); our choices of where to look and what to call it *create* the epistemological world, the object of our accident investigation.”<sup>23</sup> These labels affect everyone that reads an accident report. Leadership will base future organizational decisions on their interpretation of the findings, *causes*, and recommendations. This may include changes in policy directed toward the labeled agent of the action who lies at the “sharp end of the stick”, as Sidney Dekker calls it. These labeled agents are usually closest in time and place to the event and seem to have the best opportunity to control the safety-critical process.<sup>24</sup> However, by labeling a single part of the complex system as causal, other organizational safety and cultural issues can easily be ignored. The single, causal “bad actor” can be removed from the system and we can all feel safe again (defensive attribution hypothesis).

Accident report language can have an extended effect that goes beyond the intended audience.<sup>14</sup> A prime example from the U.S. Forest Service is the Thirtymile Fire Serious Accident Investigation Report. This 2001 report was based on the Serious Accident Investigation Guide and had a profound effect on the culture of the organization. In this accident, four wildland firefighters lost their lives during an unexpected and violent burn-over. The language shortcuts and agentive biases discussed in this paper were all present in this report. The report also used weighted binary opposition against involved firefighters, active verb voice to create a sense of human agency, and a limited human factors taxonomy that created artificial end points for analysis.<sup>14</sup>

The Thirtymile Report was used as the basis for criminal and civil prosecution of surviving firefighters, including an unprecedented charge of manslaughter against the Incident Commander. It was also used as the basis for an investigation by the Occupational Safety and Health Administration (OSHA), whose own findings became a mirrored carryover of language and blame. The media also tapped the language of the Thirtymile report, but many went a step further by reducing the linguistic explanations and escalating the blame of the human actors to say that the firefighters had failed on a *moral* level.<sup>25</sup> The Thirtymile Report is just one of many examples where agentive language can travel within an organization and external to it, sometimes resulting in extreme agentive blame. This type of accident analysis may lead to the presumption that human actors are intentional agents of failure, instead of trying to understand why an event occurred within the complex, interconnected system.

## ■ DISCUSSION

Accident investigators commonly search for Heinrich's "man failure" and place a significant weight on human error for both intentional and nonintentional events. This blame can be further influenced by fundamental attribution error, where the investigators overestimate the dispositional/personality-based qualities of the human actor and underestimate other factors that may have been involved (i.e., cultural, environmental, social, etc.). In addition, a defensive attribution bias can become a protection mechanism for investigators and organizational leaders, separating them from the presumed cause and theoretically restoring safety to the system.

Modern accident investigation models have started to acknowledge social and systemic influences, look at the context of the event, and recognize interrelations between factors. Even if human actions seem causal, systemic models treat this as the beginning of the inquiry, not the end. The change of accident analysis can have a profound effect on organizational safety culture. In order to change culture, you have to change the assumptions that drive the culture.<sup>16</sup> Language can be a major driver of this change by proactively replacing words that lead to agentive blame with descriptions that lead to a more robust and inclusive analysis of events. In 2013, the Forest Service formally replaced the Serious Accident Investigation Guide with the Learning Review, a new kind of event analysis that, "... is meant as a catalyst for understanding and to empower readers to explore, question, and learn."<sup>20</sup> The Learning Review focuses on two main components: a complex language-rich narrative, and a network of influences map that shows the context of the event and interrelations between elements.<sup>26</sup> The network of influences map does not refer to findings as "causes"; instead it tries to reflect the conditions that influenced decisions and actions, as well as their interrelations. This change of intention necessitates a change of language from the SAIG. "Searching for causes restricted our teams from exploring some very critical aspects of our organizational culture and prevented us from asking hard questions regarding the perverse nature of some of the influences we discovered. For example, we had trouble making the case for the influence of overtime pay on the behavior of our crews. We had recorded admissions of workers indicating that overtime played a role in decision-making and risk acceptance, but we could not prove a causal link. Simply shifting the conversation to "influence" was enough of a softening of language to allow a dialogue to begin that could explore the possible ways that overtime nudged decisions."<sup>27</sup> By changing the language (and thereby the model of analysis), the Forest Service was able to challenge deep assumptions around agency and blame, held by both leadership and the field. It forced the organization to ask better questions and helped achieve the goal of placing learning above simplistic causal attribution.<sup>16</sup>

Language can also be a metric for whether a positive change has occurred in an organization, as was made evident in the Forest Service once the Learning Review was adopted (please see the article in this Journal issue: Self-Designing Safety Culture: A Case Study in Adaptive Approaches to Creating a Safety Culture). Forest Service leadership knew that a change had occurred when the agentive language of blame was replaced with a language of inquiry.<sup>16</sup> This helped all levels of the organization move from a place of knowing, to a place of learning. The new language of the Learning Review also made its way into all levels of the organization. Specific words like *sensemaking*, *context*, and *influence*, which had not been

previously used by workers, safety managers, and training specialists, were now commonly evoked in conversations and in printed documents. The concept of *risk understanding* replaced risk mitigation. The word *complacency*, which had been used extensively as an attributed cause for worker failure, disappeared from discussions. The word *failure* also disappeared from both event analysis and daily dialogues involving the decisions and actions of people.<sup>28</sup> These linguistic changes point to a much larger cultural transformation, where learning became valued not only in the hindsight of accidents, but also in daily operations throughout the agency.

## ■ CONCLUSION

When an accident occurs, there is a natural tendency for us to look for "who did it" and assign agentive causality to the person closest to the event. Organizational safety in complex systems is dependent on the conditions and context that are present before, during, and after an event occurrence. Remaining in a mode of inquiry helps us learn all we can from an event.<sup>16</sup> However, "we are all probably too quick to substitute interpretation for observation."<sup>29</sup> Our interpretation of events is subject to biases that can shortcut learning and lead us to label a person as the "agent" of the action, whether or not the person had a direct or intentional role in the outcome. Biases from our organizational culture also affect how we attribute agency and can be bound to perceived needs of production, reputation protection, efficiency, and financial concerns. All of these agentive attribution biases can lead to an unhealthy safety culture and a reduction of learning from events.

Though there has been progress in accident models in recent years, the influence of language has rarely been addressed.<sup>14</sup> Causal attribution biases are influenced by the language of accident investigation guides and accident reports, which may escalate the search for human agents. This can be further exacerbated if the accident investigator speaks a language that favors causal attribution. Though most linguistic cultures use agentive language to describe intentional events, English speakers have been shown to exhibit a preference of assigning human agency to *nonintentional* events (accidents). English speakers are more affected by agentive priming language, like that found in certain investigation guides, which may lead them to assign more blame and punishment to people involved in events. All of these factors may lead to an agentive bias, where details of a situation are ignored or not recognized, and a simplistic causal attribution is applied to the human agent closest to the event.

Taxonomies are one place where priming language can create an artificial "stop rule" that tries to fit human action into preset, limited categories. Taxonomies are frequently relied upon in accident investigation and can influence investigators to regard human decisions/actions as stand-alone causes. The common use of binary opposites to describe decisions and actions (e.g., failure vs success) can also lead to simplistic human causal attribution, thereby reducing the understanding of why an accident happened. This paper also noted that the chosen verb voice (active vs passive) can directly affect causal attribution in reports. Use of the active verb voice, where the subject of the sentence is "doing" the action, implies a sense of agent control and causation, even if the accident was truly a nonintentional event or the implied agent had no direct role in the action.

Language represents one facet of the many cultural and social influences on how we apply causal attribution. The language biases, techniques, and shortcuts presented in this paper give

only a partial scope of how language affects the assignment of agency in accident analysis. The topic of language has been underestimated in the development of safer organizational systems, yet it is a critical element in how we ascribe agency to human action. This ascription can affect workplace safety standards, how leadership views workers, and if workers will be blamed and punished for accidents.

Causal attribution is a natural human tendency, but it may not play a beneficial role in event analysis for complex systems that involve people. Agentive language can reduce inquiry into the conditions surrounding an event and lead to biased conclusions of causality. Changing agentive language to a language of inquiry can result in organizational changes that positively impact safety culture. This was made evident by the transformative change of the U.S. Forest Service after they replaced the Serious Accident Investigation Guide with the Learning Review. If the goal of an organization is to learn from events, then an understanding and commitment to language must be included in the cultural change initiatives.

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### Notes

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