

A Brief Review on Ensuring Employee Safety at Work by Understanding Behavior Based Safety Method

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INTRODUCTION

Business is dynamic, and uncertainty is the primary concern in the business world today. A wide range of products and their accessibility to the consumer have increased the business to a global level. Large-scale businesses will impose more responsibilities on their employees and create a challenging culture to increase their production. When the need to reach production targets increases, there is often a probability that accidents to occur due to employees' behaviour, either habitual carelessness or accidental carelessness at work. To efficiently handle the workforce, Behavioral Safety is one of the trending techniques that will be of great help. According to the National Library of Medicine, USA, it is estimated that 90% of the accidents at work occur due to human behavior. Work-related accidents and injuries are a great concern to all industries around the world. Despite all the technological advancements and safety measures that the industrial sector is adapting to, including benefits of Artificial Intelligence, the number of serious accidents occurring is alarming around the world. The International Labour Organisation (ILO) estimates that over 2.2 million workers lose their lives to work-related illnesses and accidents each year. Around 160 million cases of work-related illness and 270 million occupational accidents that result in three-day or longer absences from work occur each year among workers worldwide.¹

The present paper focuses on understanding the concept of behaviour based safety, what are the various studies made into it and how it is going to benefit organizations if implemented as part of safety management.

REVIEW LITERATURE

Behavior-based safety (BBS) has its roots in applied behavior analysis. Early researchers used behavioral techniques to control exposure to industrial hazards (Rhoton, 1980; Sulzer-Azaroff, 1978). Starting the mid-1980's, researchers began documenting these techniques in reducing occupational injuries (Sulzer-Azaroff & Austin, 2000) and illnesses (Hopkinset al., 1986)².

In an article published on January 21, 2023, Indiaspend.com³ states that, on average, between 2017 and 2020, 1,109 people died and over 4,000 were injured in registered factories. Experts claim that these numbers are underestimates due to the informal economy's preponderance and the formal economy's underreporting of events.

According to data obtained by IndiaSpend in November 2022 through a Right to Information (RTI) request from the Ministry of Labour & Employment's Directorate General Factory Advice Service & Labour Institutes (DGFASLI), accidents in India's registered factories resulted in an average of three fatalities and eleven injuries per day between 2017 and 2020.

As many as 3,331 deaths were recorded between 2018 and 2020, but only 14 people were imprisoned for offenses under the [Factories Act, 1948](#) during the same period, the data shows.

Xingwei Li and Hongyu Long 2019⁴, in their article on "A Review Of Worker Behavior-Based Safety Research: Current Trends And Future Prospects" have mentioned that in their research, they found that China is one country with more number of research studies in this area of behavior based safety. They emphasized

the role of the government in making workers feel that they are safe and that they say is the first step of Safety management.

The increasing concern about mental well being of workers especially in the factories is to have a better understanding in various dimensions in which employees can be helped. Behavioral safety is one way in which employees can be helped to be physically and mentally safe. Behavioural safety views employees as having direct control over hazardous behaviour they engage in, such as taking shortcuts or carrying too many items. Ensuring employees safety is crucial in modern workplaces. Behavior-based safety focuses on modifying employee behavior as a whole, behavioral safety training can help in gradually reducing workplace injuries.

Unsafe workplaces and their impact on employee mental well-being

Unsafe workplaces are environments where employees face hazards that can cause physical harm, illness, or death, encompassing factors like poorly maintained equipment, inadequate safety measures, or exposure to dangerous substances.

Unsafe workplaces can be caused due to physical hazards, which include poorly maintained equipment, inadequate lighting, slippery or unsafe surfaces, lack of safety guards, blocked safety exits, inadequate ventilation and falling objects. The other major contributor is chemical and biological hazards which include - exposure to hazardous chemicals, exposure to biological hazards. Unsafe work practices can also cause unsafe workplaces. This can be caused due to lack of personal protective equipment, unqualified employees handling work, excessive workload on a single employee, poor training and supervision, Failure to use proper equipment, tools and machinery. Workplace hazards and psychological hazards can also cause unsafe workplaces. These include, workplace violence, stress and burnout, psychological harassment, lack of respect and value.

Theoretical Framework

Human Behaviour

To understand how human behaviour can impact safety at work, we need to understand some basics about human behavior. Human beings are the most complex creations in this universe. The complexities range from his simple choices to the most ultimate change over decisions. It is important to understand human behavior as it leads us to the further understanding of human behavior at work. Behaviour that changes the course of life of the organisations and their economies.

The result of every action is the behavior. Behaviour can also be defined as a response/s which is observed directly/indirectly⁵. The unpredictability of behavior is always an interesting subject for all behaviorists and it should be one for all managers and entrepreneurs too. This understanding helps us not to become weird and stubborn policy makers which will be rejected by the employees. Since behavior is unpredictable we want to predict it and make organisational life more easier for the employers and the employees.

We cannot presume a single pattern of conduct in behaviour. Behaviour was categorised by Lavitt as:

- A. Caused behaviour,
- B. Motivated behaviour,
- C. Goal oriented behaviour.

These data make it clear that behaviour is a dependent variable. One can forecast, guide, alter, and regulate the conduct of people or groups by comprehending behaviour.

The nature of human beings can be categorised into four basic assumptions: -

- individual differences,

- a whole person,
- caused behaviour (motivation) and
- value of the person (human dignity).

Nonetheless, behaviour analysis is both beneficial and essential for management. It is unlikely that a manager can carry out his duties effectively if he does not have a reasonable level of knowledge about the individuals he oversees.

Models of Human Behaviour

Psychoanalytic Model: The human conflict model is the foundation of the Freudian psychoanalytic paradigm. Freud believed that conscious explanations of behaviour were not always possible. He claims that the primary element influencing a person's behaviour is their "unconscious." According to Freud, a person's behaviour is determined by three things: (a) id, (b) Ego as well as (c) Superego. Having a basic understanding about these behavioral components helps us further understand the topic of employee behavioral safety.

Id: Id stands for pleasure. Although an individual's id might be somewhat beneficial, it can also result in negative traits like aggression, dominance, conflict, and overall destruction. People evolve, grow, and learn to regulate their id as they become older. However, it is always unintentional. The "id" becomes a significant source of thought and behaviour throughout life.

Ego: The "conscious" stage of one's behaviour is referred to as the ego. The ego relies on the superego, even when the id and ego are at odds.

Superego: It is the individual's "conscience." A person is unaware of how their superego is acting. A society's morality and cultural values are two things that influence the conscience. The formation of the superego is mostly influenced by the parents. As the kid gets older, they will subconsciously adopt their parents' principles and values.

The id, ego, and superego are always engaged in conflict. Each of them varies in intensity from person to person. Thus, this model may be used to better understand the differences in an individual's behaviour.

However, this hypothesis has been heavily criticised by contemporary theories since it lacks empirical support and, as a result, cannot be fully accepted. However, the idea of the "unconscious" makes a substantial addition to our comprehension of human behaviour.

Existential Model: There is no scientific basis for this model. Philosophy and literature provide its foundation. According to existentialists, people are forced to choose their fate because of the depersonalising consequences of this society. As a result, people create their own identities and give their "existence" purpose and value. The urbanisation of today makes this more accurate. People no longer have time for traditional values and conventions since they are so materialistic and busy, and sometimes adhering to them becomes unrealistic. The existential concept is very relevant in today's workplace.

This paradigm may be used to explain human behaviour even if it is not scientific.

Factors influencing Human Behavior:

For a brief understanding about what factors can influence human behavior, let's list out some of those factors⁶:

1. Biological Factors:

- Genetics and Heridity
- Brain structure and function

2. Psychological factors:

- Cognitive processes
- Emotions and Motivations
- Personality

3. Social Factors:

- Family upbringing
- Peer influence
- Cultural norms and values

Each of the above factors make the individual what they are. It must be remembered that each individual at workplace are already grown up adults who are already shaped by all of these above listed factors.

When we understand about basic human behavior, factors influencing their behavior, predictable consequences because of their actions, it leads us to an easy way of understanding “human behaviour at workplace” or Work Psychology”.

Human Behaviour at work:

Many of research studies in the area of organisational behaviour come to the same conclusion that “An organization's ability to succeed is not just dependent on your knowledge of marketing, organisational development, or economics. Simply said, it relies on how well you understand human psychology: How each employee interacts with your business and also with your clients.”⁷

The very initial study involving the understanding of human behaviour at work was the famous Hawthorne experiments. That was when it was understood that human beings can survive extreme physical conditions but require motivation, respect towards individuals and individual differences. Employee performance can have a great impact from the understanding, care, motivation and inspiration received from the management.

Understanding behaviour at workplace benefits us when we come to face dysfunctional workforce. Managers must be equipped to solve this dangerous behaviour.

Functional Behavior at work

Functional behaviors at work are positive actions that contribute to a productive and collaborative work environment, while “dysfunctional behaviors” are negative actions that disrupt teamwork, hinder productivity, and create a toxic atmosphere. Functional behaviors support the organisation’s goals, while dysfunctional undermine them.

Behaviors which are functional at work

- Open communication
- Constructive criticism
- Collaboration
- Positive attitude
- Taking initiative
- Respectful disagreement⁸

A functional worker is a talented, a go getter and a valuable employee in the organisation. A functional workplace can enhance the the performance of a functional worker. A functional workplace according to a reliable web source, is characterised by effective communication, clear goals and a positive culture. It can promote productivity, employee satisfaction and overall organisational success.

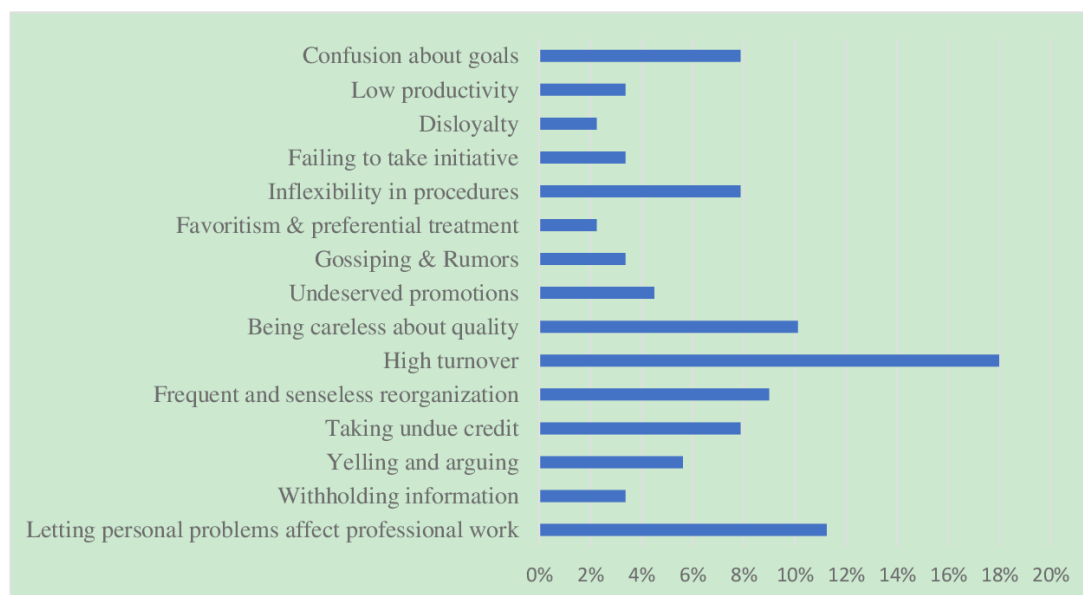
Dysfunctional behavior at work

Dysfunctional behaviour at work can often cause damage to the organisation.

Reports on material consumption at a wood processing plant did not match output numbers, indicating inefficiency on the manager's side. Speaking closely with the staff, it became clear that the boss was being symbolically fed by irate workers who were being handled harshly, damaging nice veneer sheets in the process.

The work floor at a copper mine was disrupted by the frequent tripping of the conveyor belt. The management spoke with the staff since they were sick of having it fixed again. He learnt that to combat their exhaustion, the overworked staff members tripped the belt for a break. These are some of the examples of dysfunctional behavior.

Dysfunctional behaviour is difficult to identify but managers must be observant, identify and try to rectify the problem. Omar Ramzy, Randa El Bedawy & Aya Mahe⁹ in their research paper, “Dysfunctional Behavior at the Workplace and Its Impact on Employees’ Job Performance” say that Behaviour that significantly deviates from the established standards at work is reflected in dysfunctional behaviour, which may be detrimental to the functioning of the organisation as a whole. According to the writers, bullying, aggression, workplace harassment, and rudeness are all consequences of dysfunctional conduct. Behavior of an individual employee is influenced by many factors at workplace and the behaviour of the employee/employees have an impact on their job performance, accidents, delays in production in the organisation, and also influence the moral standards in the organisation .



In the light of the above discussion, individual and group safety at work depends on the employee’s behaviour at work. When behaviour of employees is managed accidents at work can be significantly reduced.

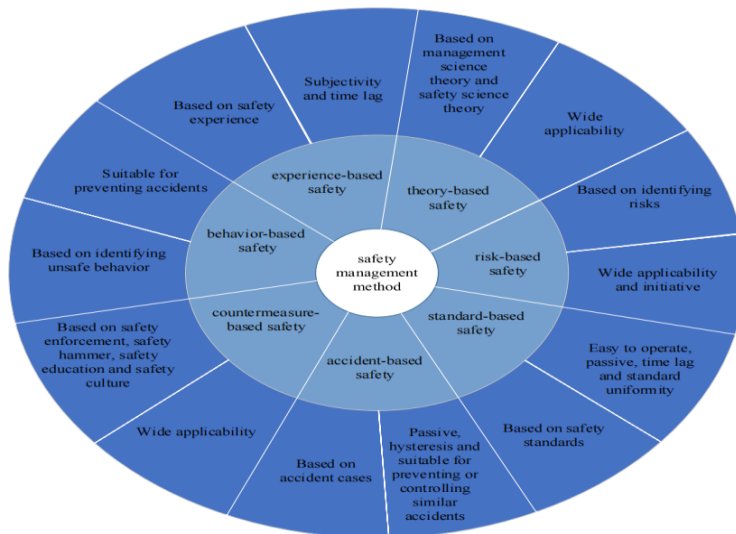
Safety at workplace

In the workplace, physical safety refers to the procedures and environments that guard against injury, accidents, and injuries. To protect workers' health and safety, it includes detecting and reducing any risks. In addition to being required by law and morality, putting physical safety first is essential to establishing a positive work atmosphere.

Integrating psychological and physical safety is crucial for developing an all-encompassing culture of well-being in organisations, claims leaderfactor.com¹⁰. They claim that companies may create an atmosphere where workers flourish by acknowledging the interaction between these two factors.

Employees' physical health is ensured by monitoring physical safety dangers and putting safety procedures into place, which lowers the chance of mishaps and injuries. In addition, encouraging psychological safety fosters a culture of trust, cooperation, and psychological health, allowing staff members to be who they really are and provide their best efforts.

A comprehensive approach to well-being improves workplace culture and creates the foundation for successful businesses. Organisations that prioritise employee safety create a culture where people feel appreciated, empowered, and supported. Consequently, this promotes involvement, creativity, and efficiency.



Research Areas of Safety Management¹¹

What is Behavioral Based Safety

One strategy to improve workplace safety is behavior-based safety. The method focusses on risks, hazards, and incidents by watching how people behave and figuring out what happens when they do it. It entails evaluating the effects of a certain behaviour and appropriately rewarding a desired behaviour.

In short, BBS allows us to nourish the power of behavioral data to change habits and reduce incident rates. Carra, S.; Bottani, E.; et al.,¹² in their article, Implementation of Behavior-Based Safety in the Workplace: A Review of Conceptual and Empirical Literature, very effectively elaborated the origin and significance of BBS. They mentioned that the introduction of the term “Behavior-Based Safety” (BBS) is attributed to E.S. Geller, who coined it in 1979, referring to the use of applied behavior analysis methods to achieve continuous improvement in safety performance. The authors opined that behavior-based approaches in the workplace has mainly originated from the expectation of overcoming the results obtained by traditional methodologies as training and inspection-sanction systems, starting from the observation that knowledge does not necessarily lead to safe actions and that methods like blame and punishment cannot be used too extensively in practice because they worsen the working climate and endanger co-operation within the organization. This thought has to be agreed upon by all especially organisations involved with workers exposed to various dangers at work. The authors identified bbs as very close to the reinforcement theory of motivation and suggest that real-time functionality through technological support, involvement of all hierarchical levels in companies, attention to workers’ (and workplace) peculiarities and the ability to adapt the method to different contexts through more and more specific application variants can help in ensuring employees safety at workplace.

According to Vijaiarasan, Environment, Health and Safety Manager at Danieli Group in his article(2021)¹³, says that most employers and employees in the area of safety will agree that the ultimate aim of the safety initiative is a “total safety culture”; however, this concept is rarely defined.

Total safety culture is a culture in which:

- a) Individuals hold safety as a ‘value’ and not just a priority;
- b) individuals take responsibility for the safety of their co-workers in addition to themselves; and
- c) all levels of employees are willing and able to act on their sense of responsibility – they can go ‘beyond the call of duty’



Human Brain and Workplace safety

Human brain is a funny part says talentlms.com. It further says that 70% of our daily activities are carried out with our brains on autopilot. To explain their conclusion, they say that learned behavior happens through repetition. So, when you do something over and over, your brain takes a rest, because it thinks it’s got everything completely under control. But even though the way the brain has learned to do something that might be functional, it also might not be the safest way to do it. That could be problematic at workplace. So it needs to be recognized and controlled. Behavioral safety is a way to do just that, through identifying these learned behaviors, and working to retrain the brain to carry out tasks more safely¹⁴.

The human brain plays a central role in how individuals perceive and respond to safety-related stimuli says Edwin Figueroa-Nazario¹⁵, Director, Environmental Health and Safety North America at Sodexo in his article, “Brain-Based Safety: Understanding the Neuroscience of Workplace Safety”, he says that by understanding the neuroscience behind safety behavior, organizations can better design safety protocols, training programs, and interventions that resonate with employees at a deeper level. The following key points help us understand the brain based safety mechanisms better -

- **Risk Perception:** One of the fundamental aspects of workplace safety is how individuals perceive risks in general and at work specifically. The brain processes information about potential risks based on various components, including past experiences, emotions, and cognitive preconceptions. By understanding these underlying processes, organizations can establish their safety messages to effectively communicate risks and encourage safer behaviors.
- **Emotional Regulation:** It has been proven by many studies that emotions play a significant role in shaping behavior, including safety-related actions. Decision making can be impaired due to individual’s sensing stress, fear, and anxiety and increase the likelihood of accidents. Brain-based safety emphasizes strategies for promoting emotional regulation and resilience in the workplace, such as mindfulness training, stress management techniques, and fostering a supportive work environment.
- **Habit Formation:** Many safety behaviors are driven by habits rather than conscious decision-making. The brain is wired to automate routine actions to conserve cognitive resources. By leveraging the

principles of habit formation, organizations can instill safe behaviors among employees through consistent reinforcement, feedback, and positive reinforcement.

- **Social Influences:** Humans are inherently social beings, and social dynamics within the workplace can influence safety behavior. The brain is sensitive to social cues and norms, which can either reinforce or undermine safety practices. Brain-based safety interventions recognize the importance of peer influence and leadership behavior in shaping a safety culture where employees feel empowered to speak up about safety concerns and hold each other accountable.
- **Learning and Train:** The brain's capacity for learning and adaptation provides opportunities for improving safety outcomes through effective training programs. Brain-based safety training incorporates principles of cognitive neuroscience to enhance learning retention, engagement, and application of safety knowledge in real-world scenarios.
- **Neuroergonomics:** Another emerging area within brain-based safety is neuroergonomics, which explores the interaction between the brain and the work environment. By optimizing factors such as workspace design, equipment ergonomics, and task allocation, organizations can reduce cognitive load and fatigue, thereby enhancing safety performance.

Brain-based safety offers a fresh perspective on how organizations can enhance workplace safety by integrating insights from neuroscience into safety management practices. By understanding how the brain processes information, regulates emotions, and forms habits, organizations can develop more effective safety interventions that resonate with employees and ultimately create safer work environments.

Aruna Girinathan¹⁶, in her thesis on A Study On Behavior Based Safety Management,(Concerning Visakhapatnam Steel Plant,Visakhapatnam) identified the following objectives of Behaviour based safety:

In the researchers own words, “ The purpose of a Behavior Based Safety process is to reduce incidents triggered by unsafe or at-risk behaviors. To achieve this, specific behavioral problems are identified by focusing on incidents that result from the interaction between people and their working environment. Behavioral Based Safety implementation has provided breakthrough levels of improvement in the following areas:

- Reductions in serious injuries
- Reductions in accidental releases of hazardous materials
- Reductions in regulatory agency violations
- Reductions in property damage incidents
- Improved Security preparedness
- Increases in critical tests and inspections conducted on schedule.

CONCLUSION

As a conclusion, we understand that the safety of employees at the site of work is the most important task of every employer. It marks an identity or a brand image for the company which in turn impacts its future recruitment, and also the motivational levels of the present workforce. It is never a good option to be labelled as an unsafe workplace. Employees need to feel safe to work for the organisation. It must be more convincing for employees that all safety precautions have been taken properly by the organisation. Though the organisation runs its regular safety and maintenance checks, employee behavioral checks through frequent observations, feedbacks also must be taken as a routine to ensure safety precautions at a deeper level. Understanding the risk perception levels, emotional regulations, habit formations, social influences of the employees must be observed, employees learning capacities and the neuroergonomics and its influences on the

employee behavior must be listed out and must be always be reviewed from time to time. Taking the benefits of BBS into consideration, organisations involving high risk at workplace must adapt to this new trend to safeguard their employees. Managers must be given training in how to recognize the triggering behavioral points of employees and also how to put it under control. A fast developing like India, increasing its borders in manufacturing sector, must learn not to leave any stone unturned if it is going to benefit the organisation and a nation at large. Organisations and Researchers must extend their studies deeper on this valuable, silent yet effective method of reducing workplace accidents, injuries, loss of lives and loss of production for the organisations.

REFERENCES

1. ILO . World day for safety and health at work 2005: a background paper. Geneva: International labour organisation; 2005. [[Google Scholar](#)])
2. Xingwei Li and Hongyu Long 2019, A Review of Worker Behavior-Based Safety Research: Current Trends and Future Prospects, IOP Conf. Ser.: Earth Environ. Sci. **371** 032047
3. <https://www.indiaspend.com/special-reports/3-workers-die-every-day-in-indian-factories-govt-data-show50083#:~:text=India%20reported%201%2C109%20deaths%20and,figures%20are%20underestimates%2C%20say%20experts>
4. Xingwei Li and Hongyu Long 2019, A Review of Worker Behavior-Based Safety Research: Current Trends and Future Prospects, IOP Conf. Ser.: Earth Environ. Sci. **371** 032047
5. Jim Spigener, Gennifer Lyon, and Terry McSween, Behavior-based safety 2022: today's evidence, Journal Of Organizational Behavior Management 2022, VOL. 42, NO. 4, 336–359 <https://doi.org/10.1080/01608061.2022.2048943> © 2022.
6. <https://egyankosh.ac.in/bitstream/123456789/30781/1/Unit-4.pdf>
7. <https://www.notesworld.in/>
8. www.arunk.com
9. Omar Ramzy, Randa El Bedawy & Aya Mahe, “Dysfunctional Behavior at the Workplace and Its Impact on Employees’ Job Performance,
10. www.leadership.com
11. Xingwei Li and Hongyu Long 2019, A Review of Worker Behavior-Based Safety Research: Current Trends and Future Prospects, IOP Conf. Ser.: Earth Environ. Sci. **371** 032047
12. Carra, S.; Bottani, E, et al., Implementation of Behavior-Based Safety in the Workplace: A Review of Conceptual and Empirical Literature,
13. <https://www.mdpi.com/journal/sustainability>, Sustainability 2024, 16, 10195. <https://doi.org/10.3390/su162310195>
14. VIJAIARASAN P.A, Environment, Health and Safety Manager at Danieli Group in his article(2021).
15. <https://www.talentlms.com/library/what-is-behavioral-safety/>
16. Edwin Figueroa-Nazario, Brain-Based Safety: Understanding the Neuroscience of Workplace Safety, <https://www.linkedin.com/pulse/brain-based-safety-understanding-neuroscience-edwin-figueroa-nazario-sctie>
17. Aruna Girinathan, thesis on A Study On Behavior Based Safety Management,(With Reference to Visakhapatnam Steel Plant, Visakhapatnam)
18. [http://www.academia.edu/48474697/Dysfunctional Behavior at the Workplace and Its Impact on Employees Job Performance](http://www.academia.edu/48474697/Dysfunctional_Behavior_at_the_Workplace_and_Its_Impact_on_Employees_Job_Performance)
19. <https://safetyculture.com>
20. The Psychology of Enhancing Human Performance The Mindfulness-Acceptance-Commitment (MAC) Approach, Gardner, Frank L., PhD, ABPP | Moore, Zella E., PsyD, Published: July 2007.