

Original research article

# Organizational cognitive neuroscience: A step ahead in understanding counterproductive workplace behavior

Marium Arslan Zuberi\*, Amir Mahmood, Nasir Mahmood Qureshi

Bahria University Islamabad, Islamabad 4400, Pakistan

\* Corresponding author: Marium Arslan Zuberi, Mariumnasir75@yahoo.com

**Abstract:** This paper discusses the dawn of cognitive neuroscience in management and organizational research. The study does that in two tiers: first, it reviews the interdisciplinary field of organizational cognitive neuroscience, and second, it analyzes the role organizational cognitive neuroscience (OCN) could play in reducing counterproductive workplace behaviors (CWB). Theoretically, the literature has established the benefits of a neuro-scientific approach to understanding various organizational behaviors, but no research has been done on using organizational neuroscience techniques to study counterproductive work behaviors. This paper, however, has taken the first step towards this research avenue. The study will shed light on this interdisciplinary field of organizational cognitive neuroscience (OCN) and the benefits that organizations can reap from it with respect to understanding employee behavior. A research agenda for future studies is provided to scholars who are interested in advancing the investigation of cognition in counterproductive work behaviors, also by using neuroscience techniques. The study concludes by providing evidence drawn from the literature in favor of adopting an OCN approach in organizations.

**Keywords:** organizational cognitive neuroscience; counterproductive workplace behaviors; organizational behavior; aggression and abuse; absenteeism; misuse of information and resources

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## 1. Introduction

Neuroscience over the next fifty years is going to introduce things that are mind-blowing.

David Eagleman

The above words are a very humble depiction of the vast applicability of neuroscience. Neuroscience is an interdisciplinary field of study that seeks to understand behavioral phenomena in terms of the brain mechanisms and anatomy that produce cognitive processes, attitudes, and behavior. This field has been of importance for quite a long time<sup>[1-3]</sup>. It has now started overlapping with other disciplines of study, providing assistance and guidance in numerous other social science domains like leadership, economics, marketing, etc.

For more than a decade now, its overlap with organizational behavior has also gained attention<sup>[4]</sup>. This has laid sound foundations for the conceptualization of organizational cognitive neuroscience. Organizational cognitive neuroscience (OCN) is, however, a very nascent research domain within the field of management<sup>[5]</sup>. It integrates organizational behavior with neuroscience while taking into account the social-cognitive context. OCN primarily stems from social cognitive neuroscience<sup>[6,7]</sup>. Social cognitive neuroscience analyzes human behaviors at three distinct levels: the social level, the cognitive level, and ultimately the neural level<sup>[8]</sup>. Given

that, one can relate to how it appears to be applicable to employees in an organizational setup. For instance, considering the human resource point of view, we know that all aspects, like training, staffing, retention, etc., are employee-oriented. Adopting a neuroscientific approach to any such phenomenon would entail studying the employees at:

- Social level: human interactions at multiple levels of hierarchy, organizational culture and environment, rules and regulations, etc.
- Cognitive level: individual thought process or group thinking. Overall perceptions regarding the phenomenon.
- Neural level: brain mechanism and structural functioning that makes up for the deriving factor behind the perceptions or decisions of employees both at individual and group levels.

An in-depth analysis of all three levels would show certain coherence; only then could the particular phenomenon be successful in its purpose. However, deviations from this alignment would suggest the problem at hand. Any discrepancy among these levels of analysis must be eliminated to get the desired results.

The current study tends to focus on the applicability of organizational cognitive neuroscience to a rather serious problem of counterproductive workplace behavior (CWB) faced by most organizations worldwide. Such behavior can be broadly defined as the pattern of actions and interactions of the members of an organization that directly or indirectly harms its effectiveness<sup>[9,10]</sup>. Griffin et al.<sup>[11]</sup> say that almost all definitions describe counterproductive workplace behaviors as a disregard for societal and organizational rules and values. The application of neuroscientific techniques and methodologies in an organizational setting can aid in shaping workplace behaviors in such a way that would ultimately enhance the organization's effectiveness while eliminating counterproductive behaviors.

Recent advances in technology have made it possible to use brain imaging in organizational setups at relatively little expense and in a practical manner to further research efforts<sup>[5]</sup>. Balthazard and Thatcher<sup>[12]</sup> have impeccably highlighted the kind of neuroscientific technology that can be used to study organizations. Extant literature points towards expanding this avenue of research<sup>[5,13,14]</sup>. Now would be the time for scholars to step ahead in this field so that it emerges successfully out of its infancy as a fully mature discipline with numerous practical applications for organizations to benefit from. For this to happen, organizational neuroscientists should eagerly start unearthing the plausible outcomes of applying the neuroscientific approach to each and every phenomenon of the organizational setup, be it human resource management (employee training, recruitment, performance appraisals, compensation), organizational behavior, change management, etc. The study will further advance claims made by Waldman et al.<sup>[14]</sup> by providing more evidence of the benefits of incorporating neuroscience into organizational setups. To provide such evidence, this article will apply a neuroscientific approach to counterproductive work behaviors. Counterproductive workplace behavior (CWB) and its various dimensions shall be analyzed through the lens of neuroscience<sup>[14]</sup>.

A recent systematic review has explicitly highlighted how future research should study OCN in relation to work-related behaviors<sup>[15]</sup>. A few other theoretical studies have also discussed OCN's relationship with different facets of organizational behavior (OB) and its promising impact on organizational behavior research and practice<sup>[4,13,14]</sup>. Neşe<sup>[4]</sup> has discussed how organizational neuroscience can help improve leadership skills and patterns in business environments. Similarly, Waldman et al.<sup>[14]</sup> have taken up a few topical areas of individual and group work behaviors to show how these candidates can utilize the added value of neuroscience. This study extends its efforts by applying the OCN approach to explore organizational issues. The phenomenon of counterproductive work behavior serves as a representative construct of OB to show how neuroscience may

affect organizations in resolving their issues. To the best of our knowledge, there is a complete lack of research studying counterproductive workplace behavior from the lens of organizational neuroscience. This study, however, takes the first step in this regard. Although theories that form the basic themes of counterproductive work behavior are mostly found in psychology, such as social learning theory and reinforcement theory (details are provided in the next section), we propose that, in addition to psychological theories, organizational cognitive neuroscience can provide us with more in-depth explanations regarding such deviant behaviors. The focus here is more on providing additional insights into the challenging issue of counterproductive behaviors than establishing its cause-and-effect relationship with other constructs, which have already been studied countless times<sup>[16–18]</sup>.

The study not only urges the adoption of the neuroscientific approach along with traditional tools and techniques but is also a step ahead in the scholarly debate that continues on the advantages and acceptance of neuroscience studies in organizational studies. It will help bridge gaps between the advocates and challengers of organizational neuroscience.

## **2. Literature review**

Organizational neuroscience is rather a new field, but it stems from the established and well-understood domain of “social neuroscience”, which emerged as a field in the 1980s by integrating the fields of social psychology and neuroscience. Social neuroscience strongly complements organizational behavior. It entails a multilevel approach involving factors both internal and external to the individual, where internal factors account for aspects like individual differences, internal mental processes, etc., and external factors are environmental factors, organizational contexts, etc.<sup>[19]</sup>. Primarily, organizational neuroscience appears to be neuro-anatomical in its perspective, mainly focused on the role that brain anatomy plays in the mediation of organizational decisions<sup>[20]</sup>.

Cognitive neuroscience, with a slight variation, focuses on the underlying biological processes of the entire nervous system, going down to the minute neurons and their functioning, which results in cognitive functions in humans<sup>[6]</sup>. It could therefore be said that all these domains of neuroscience, including cognitive neuroscience, organizational neuroscience, and social neuroscience, are closely linked and overlap at some point. They tend to be symbiotic in their relationships with each other<sup>[21]</sup>. Organizational cognitive neuroscience, however, can be considered to be the most in-depth utilization of neural structural aspects for studying human behavioral responses in an organizational setting since it not only studies the brain structure but also encompasses the cognitive abilities of the human brain with reference to the social context<sup>[4]</sup>.

The term ‘cognitive neuroscience’ was first coined by Miller and Gazzaniga<sup>[22]</sup> towards the end of the 1980s. It amalgamates the best of both disciplines, with neuroscience on the one hand and cognitive science on the other. Without either of the above, the main reason behind the ontology of the field of OCN would fail. One cannot understand an organizational phenomenon from the bottom up, considering brain systems and structures as basic building blocks and studying them in isolation from the context. Similarly, it is also not possible to get accurate findings from top-down organizational research that does not take into account knowledge of cognition and neural functions<sup>[23]</sup>. From a research point of view, the world is still in the phase of accepting or rejecting this overlap of organizational studies and neuroscience, still answering questions like whether it is time- and cost-effective. Is it worth all the effort or not?

Most of the literature available regarding this discipline is not even a decade old<sup>[6,7,16,20,21,24,25]</sup>. Now scholars have started moving onward to the practical application of organizational setups in real time. For instance, few scholars have studied neuroscientific technologies like fMRI and qEEG<sup>[12]</sup> in detail. A few have

applied these techniques to sample groups for assessing organizational phenomena<sup>[14]</sup>. Research regarding these techniques is gaining more and more attention. However, functional magnetic resonance imaging (fMRI) is the brain imaging technique that appears to be abreast of all the methodologies of neuroscience research. By taking the magnetic properties of blood into account, this technique detects localized changes in the brain's blood oxygen levels, which are considered to relate to the areas of the brain that are in use while participants are engaging in various organizational tasks or mental processes<sup>[24]</sup>. Today, functional neuroimaging is successfully rendering help by opening avenues for major sciences like psychology, psychiatry, and neurology by offering the use of the newest technologies<sup>[12]</sup>. The intention of this paper, however, is not to go into the technical details of these neuroscientific technologies since ample information regarding their functioning and practical usability is already available. These techniques have been used in medical and neural sciences for a very long time now.

## **2.1. A critical analysis of organizational cognitive neuroscience**

At this point in time, when there is a lot of hype regarding this new and emerging field of study and a lot of literature coming up in support of this field, there tends to be a group of scholars who contradict the idea of applying neuroscience in organizations. This has resulted in a literary debate between the two schools of thought. The challengers have raised arguments on whether the field of OCN is of any potential benefit for organizational setups or merely a management fad. These arguments include ethical issues like privacy distortion and challenges regarding the reductionism of organizational and neuroscience theories<sup>[25]</sup>. Explanations for a few of these challenges are provided by supporters of OCN<sup>[26]</sup>. A few other explanations still need clarification. The effort here in this article is, to some extent, if not completely, to clear this misunderstanding and fill the gap between the supporters and opponents of organizational neuroscience.

Even the protagonists of organizational neuroscience cannot disregard the issues encountered by this discipline, such as the claim made by Lindebaum and Raftopoulou<sup>[25]</sup> that organizational cognitive neuroscience cannot completely revolutionize organizational and management studies, but simultaneously, it is argued that it is just a step ahead in understanding organizations and not a single-handed cure for all organizational dilemmas. It provides an additional approach that can augment and strengthen traditional organizational psychology methodologies. Incorporating neuroscience in an organizational context can provide new insights into various phenomena like implementing and managing change, retaining key employees, hiring the right employee for the right job, etc. In a similar fashion, organizational behavior also gets its due share of benefits from the discipline of OCN. Counterproductive work behavior is a vastly prevalent issue that negatively affects productivity in many organizations. As this paper progresses, we shall see how counterproductive work behavior responds to OCN.

## **2.2. Counterproductive workplace behavior (CWB)**

Counterproductive workplace behavior (CWB) is a modern name assigned to all such volitional actions that ultimately harm the organization or its stakeholders<sup>[18]</sup>. A lot of work has already been done on measuring such behaviors and ways to minimize them<sup>[27-30]</sup>. Unfortunately, this dilemma still persists.

There tend to be three key paradigms or theoretical frameworks that are always referred to as accounting for behavior in both psychology and the organizational sciences:

- 1) Expectancy theory<sup>[31]</sup> states that human behavior results from intentionally choosing alternatives that would maximize pleasure and minimize pain.
- 2) Reinforcement theory<sup>[32]</sup> argues that a combination of rewards and punishments is used to reinforce desired behavior or to avoid unwanted behavior.

- 3) Social learning theory<sup>[33]</sup> claims that human behavior is learned from the environment or the social context through the process of observational learning. Neuroscience has lately described such behavior with regard to “mirror neurons” (described later in this section).

These theories are well-known in the organizational sciences and encompass all behavioral aspects, including antecedent or environmental context, information processing, individual perception, and expected outcomes or reinforcement elements. In short, these paradigms indicate that counterproductive behavior is the result of a complex interaction between the person and the environment and that the individual’s causal reasoning about the environment and expected outcomes drive the individual’s behavior<sup>[34]</sup>.

Various typologies and dimensions of counterproductive behaviors have been proposed in a wide variety of studies up until now. Griffin et al.<sup>[11]</sup> describe the psychology of dysfunctional job performance; Folger and Skarlicki<sup>[35]</sup> attempt to explain CWB from a theoretical perspective of aggression, Greenberg<sup>[36]</sup> focuses on employee theft; and Dalton and Wimbush<sup>[37]</sup> explain volition. Other works on CWB include sabotaging, absenteeism, theft, being late to work or leaving early or withdrawing effort from work, violence against coworkers, supervisors, and subordinates at a workplace, and cyber-loafing<sup>[16,36,38]</sup>.

Different classifications have also been presented, among which scholars often adopt the typology proposed, by Robinson and Bennett<sup>[39]</sup> for their studies. Robinson and Bennett<sup>[39]</sup> broadly classified deviant work behaviors by dividing them into four major categories: 1) property deviant, activities that damage an organization’s properties, like theft; 2) political deviant, activities that people demonstrate while interacting with organizational members, leading to unethical and unhealthy political activities such as spreading rumors, gossiping, etc.; 3) personal aggression, implying tough or aggressive behaviors towards colleagues and managers; 4) production deviance, employee behaviors that lead to low production levels, like slacking, misuse of working hours, absenteeism, etc.

A dichotomy has also been identified regarding CWB. It originally arose from the multidimensional scaling study by Robinson and Bennett<sup>[39]</sup>. It distinguishes CWBs, which are interpersonally directed, from those that are organizationally directed. Examples include gossiping about coworkers (CWB-I) and coming late to work (CWB-O). The interpersonally directed versus organizationally directed distinction was further studied by Gruys and Sackett<sup>[30]</sup>.

This study aims to address this widely prevalent organizational dilemma through the use of an additional approach to cognitive neuroscience. Counterproductive behaviors stem from human psychological issues and have already been addressed by I-O psychology, but studying human minds along with their structural brain functioning is a combination that can provide much more useful insights regarding employees exhibiting such behaviors, so neuroscience sounds relevant enough because it is a more holistic view of the human mind and brain. Moreover, the context is organizations, so OCN is the discipline that can analyze this predicament in the best possible way.

The study commences by selecting four dimensions of counterproductive workplace behavior at an individual level, one for each of the categories of Robinson and Bennett’s<sup>[39]</sup> typology. The dimensions include misuse of resources, misuse of information, absenteeism, aggression, and abuse.

### **2.2.1. Absenteeism**

Absenteeism falls within the category of withdrawal. Withdrawal consists of behaviors that result in the reduction of working time to less than what is required by the organization. It includes absence, arriving late or leaving early, and taking longer breaks than authorized. According to the Robinson and Bennett<sup>[39]</sup> typology mentioned above, it falls into the production deviance category. Production deviance is the deliberate failure

to perform job tasks effectively in the way they are supposed to be performed. It is based in part on Hollinger's concept of production deviance<sup>[40]</sup>.

Among the various forms of withdrawal behavior, absenteeism has received the most attention. Early models have described it as a response to dissatisfaction at work<sup>[38]</sup>. More recent research has suggested that absence can occur for a variety of reasons. Health, psychological disorders, stress, organizational norms, culture, workforce-management conflict, and individual differences have been listed as potential influences on absence<sup>[38]</sup>. Koslowsky<sup>[41]</sup> while elucidating the work-family conflict, states that withdrawal is most of the time instrumental, adopted as a means of coping with conflicting work and personal life obligations. Absence contrasts with other forms of deviant behavior because it is an attempt to avoid or escape a situation rather than direct some harm. An individual might wish to escape stress, injustice, dissatisfaction, or situations that induce negative emotions. Organizational cognitive neuroscience can provide the inside picture of employee emotions and thought processes leading to absenteeism. It can add to the knowledge by providing biological information behind the act of absence. Hence, the issue of absenteeism can be reduced to the minute neurons inside the individual's brain. This concept of reductionism with respect to OCN has been duly addressed by scholars previously<sup>[20,42]</sup>.

### **2.2.2. Misuse of resources**

Misuse of organizational resources entails all such acts as sabotage, theft, stealing from employers, or using unauthorized resources for personal purposes. Sabotage is destroying physical property that belongs to the employer<sup>[43]</sup>. Ambrose et al.<sup>[44]</sup> noted that sabotage can be done for instrumental purposes or as a result of anger and hostile feelings, such as actions taken to affect some organizational change process, gain peer acceptance, or gain a competitive advantage over peers. Robinson and Bennett classified it as property deviant behavior since sabotaging equipment is a direct harm to organizational property. Another form of sabotage could be against co-workers in the form of putting their future at risk by sabotaging their chances of a promotion they want for themselves or obstructing them from succeeding in their careers. Mangione and Quinn<sup>[16]</sup> infer that sabotage is a symptom of job dissatisfaction. It's a cause-and-effect relationship, with job dissatisfaction being the cause and sabotage, being its effect. Individuals who are not satisfied with their employers tend to become destructive towards their property; for instance, one might purposefully damage his employer's car to seek revenge for being superseded. Theft can be both ways: stealing from co-workers or stealing from the employer, for instance, taking stationery items home. Theft is assumed to have more instrumental than hostile motives<sup>[18]</sup>.

### **2.2.3. Aggression and abuse**

Abuse refers to behaviors that cause physical or psychological harm to coworkers or others. It could be either of the following: making threats, passing nasty comments, ignoring an individual, or undermining the individual's ability to work effectively. Within the organizational setting, cases of sexual harassment, verbal abuse, endangering colleagues, etc. all fall under this category of abuse or personal aggression as per the Robinson and Bennett<sup>[39]</sup> typology. Such behaviors are direct forms of human aggression. Physical aggression in the workplace tends to be infrequent, so most research studies have focused on nonphysical forms only. Geen<sup>[45]</sup> notes that aggression is a result of both dispositional and environmental variables; therefore, some studies have been directed toward identifying an aggressive personality type. Stressors at the workplace and other unpleasant situations are linked to hostile aggression through negative emotions<sup>[46]</sup>. Direct links between stressors at work and counterproductive work behaviors directed toward others have been shown before<sup>[47,48]</sup>. Keashly and Harvey's study<sup>[49]</sup> on emotional abuse in the workplace adds to the aggression literature; they also identified some additional factors that contribute to such behaviors. Workplace bullying or mobbing is another

particularly malicious form of behavior that involves: “all the repeated actions and practices that are directed to one or more workers, which are unwanted by the victim, which may be done deliberately or unconsciously, but clearly cause humiliation, offense, and distress, and that may interfere with job performance and/or cause an unpleasant working environment”<sup>[50]</sup>.

### 2.2.4. Misuse of information

Information at every level plays a key role when it comes to organizations. Misusing is one form of deviant work behavior that has been categorized by the Robinson and Bennett<sup>[39]</sup> typology as political deviant behavior. The damage caused by such acts spreads across a long continuum, with mere gossiping on the one hand and corporate espionage on the other that can lead to as harmful effects as bankruptcy. Such counterproductive behaviors sometimes lead to huge white-collar crimes like releasing confidential information and trade secrets.

### 2.3. The OCN approach

Numerous managerial solutions and approaches to tackle CWB have been proposed in various research studies and practically applied in organizations as well. Still, this issue persists. This is clear proof of the fact that managerial studies alone have not been quite sufficient in addressing this dilemma. As explained earlier in this paper, organizational cognitive neuroscience is adding to the knowledge of a lot of disciplines by providing additional levels of analysis. A similar application of OCN is proposed here to the concept of counterproductive behaviors and its various dimensions elaborated in the previous section.

Human behavior is a product of a number of interconnected systems and processes rather than being the result of a single motivator. This is an important insight because it reveals how the rationale behind our behavior can considerably deviate from its original cause. For this, OCN provides us with a one-stop solution, which is neuroimaging. Neuroimaging has the capacity to co-locate the cortical substrates that mediate decision-making processes within the brain and to relate the processes to time, ultimately revealing the interconnected systems behind a single human behavior<sup>[5]</sup>. Waldman et al.<sup>[14]</sup> conducted qEEG research that empirically identifies the neural patterns associated with desirable behaviors. So, this connection of neural studies to desirable behaviors can further be extended to seek reasons behind undesirable or counterproductive behaviors. Brain studies reveal countless concepts that can all be helpful in understanding human behavior. Major ones that advocate the OCN approach to understanding CWBs have been listed in **Table 1**.

**Table 1.** Basic concepts behind OCN approach.

Concepts	Brief explanation	Authors
Forward and reverse inference	Forward inference is studying the resultant behaviors from activation of a particular brain region whereas reverse inference is to trace back the activated brain region behind a particular behavior. OCN approach tends to combine both these paradigms.	Lee et al. <sup>[21]</sup>
Explicit and implicit attitudes	Implicit attitudes are automatic and outside the domain of conscious awareness whereas explicit attitudes are more deliberate, conscious, and self-reportable.	Becker et al. <sup>[20]</sup> Perugini <sup>[51]</sup>
Mirror neuron	Mirror neuron system that explains why workers automatically and often do not knowingly imitate one another’s behavior and feelings.	Goleman <sup>[52]</sup> Becker et al. <sup>[20]</sup>
Neuroessentialism	Reflects the belief that all identity and behavior can be reduced to individual neurons.	Bickle <sup>[53]</sup> Racine et al. <sup>[54]</sup>

**Table 1.** (Continued).

Concepts	Brief explanation	Authors
Neurofeedback	Involves measuring brain activity using EEG and feeding this information back to modify behavior.	Kaiser and Othmer <sup>[55]</sup>
Hierarchical reductionism	The concept of reducing phenomena to very basic levels of analysis. OCN provides an additional level of analysis for management studies, i.e., the neural level.	Becker et al. <sup>[20]</sup>
Human consciousness	Neuroscience believes that the human brain has the capacity to perceive things outside of an individual's conscious awareness as well. This objective perception plays a vital role in shaping an individual's behavior.	Becker et al. <sup>[20]</sup>

Due to the limited scope of the study, it is not viable to address all these concepts in depth. However, references have been provided for details. The concepts mentioned in **Table 1** together form a strong basis for adopting a neuroscientific approach towards counterproductive behaviors. All these concepts have been discussed by Becker et al.<sup>[20]</sup>. In their paper, they have elucidated the matter of human consciousness. According to them, human consciousness has important limitations. Neuroscience takes a somewhat different stance on how to view human thinking and feeling. Brain research indicates that a good deal of processing takes place outside the limits of our conscious awareness. For this reason, organizational neuroscience suggests that greater emphasis be placed on non-conscious processing, an ability that traditional managerial methodologies lack.

Another aspect is that of hierarchical reductionism. It refers to how any phenomenon can be analyzed at various levels, since one level alone is never sufficient. For instance, in organizational settings, every phenomenon is analyzed at three distinct levels: the organizational, the group/team level, and finally the individual level. The OCN approach provides an additional level of analysis by deconstructing individuals further into discrete brain structures. As these neural processes are homogenous to all humans, this additional level of reduction can help in unearthing new and effective solutions to counter deviant behaviors. OCN helps scholars identify certain themes. These themes elucidate particular networks of brain systems that are responsible for workplace attitudes and behaviors. It can be concluded; that prior organizational theories are incomplete in the sense that they do not consider the most fundamental level of analysis.

Becker et al.<sup>[20]</sup> also shed light on another concept of implicit versus explicit attitudes. Implicit attitudes are automatic and outside the domain of conscious awareness, whereas explicit attitudes are more deliberate, conscious, and self-reportable. Organizational behavior research has emphasized the impact of explicit attitudes on work-related outcomes<sup>[56]</sup>. However, few scholars tend to disagree. They argue that explicit processing is limited, so future organizational research should consider implicit attitudes as well<sup>[57,58]</sup>.

Hence, in organizational studies, the self-reported accounts of employees regarding their behaviors will often be logical and consistent and might also predict future outcomes, yet be absolutely inaccurate with respect to describing the true mechanisms behind those behaviors. This helps explain the inability of experts to resolve a lot of managerial issues because true findings are largely inaccessible<sup>[59,60]</sup>. With respect to counterproductive behaviors, employees may not be able to accurately verbalize the actual reason for their deviant behaviors. For example, an individual who is overly distressed by some family/personal issues might render some uncertainty about his job as the deriving reason behind his aggressive behavior at work. In this example, the aggression comes from an implicit response, and the explicit opinions are merely creative rationalizations. A manager who is unaware of this deeper cause might seek to address the stated concerns through reasoned communication regarding the employees' job insecurities rather than proposing some counseling sessions.

## 2.4. Counterproductive work behaviors through the lens of neuroscience

Drawing from the literature provided, it can be established how cognitive neuroscience can contribute to addressing counterproductive work behaviors. The concepts like mirror neurons, implicit explicit attitudes, and forward and reverse inferences (explained earlier) form the foundation for this argument. Referring to mirror neurons as proposed by Becker et al.<sup>[20]</sup> employees might be biologically imitating one particular employee's counterproductive behavior because of their mirror neuron system. So the problem might not be with the entire department but with that particular employee, whose behaviors were adopted by others over time. Management might spend a lot on the whole department when only one employee needs correction. OCN can identify this underlying cause and save the organization from extra expenditures.

Similarly, OCN's approach of forward and reverse inferences can guide in identifying causal factors behind counterproductive work behaviors<sup>[21]</sup>. Behind every negative behavior, a particular brain region is illuminated under certain neuroscientific tests like fMRI. Tracing back from the exhibited behavior to the illuminated region of the brain can give ample information on the reason behind that particular behavior. For instance, an employee is abusive or aggressive at the workplace. When put under functional magnetic resonance imaging, a particular brain region that is activated in response to the employees' aggressive behavior could be identified, and it could be observed that the same region gets illuminated for feelings of sorrow. This could mean that the employee is grieving over something in his personal life that causes him to become aggressive.

The same is the case with the concept of implicit and explicit attitudes<sup>[53]</sup>. Mostly, the focus is on explicit attitudes, which are deliberate and conscious attitudes, but OCN argues that implicit attitudes are equally important in understanding human behavior. So, employees in organizations might be exhibiting certain counterproductive behaviors implicitly when their unconscious intentions behind them might be entirely different. Hence, understanding these automatic and non-deliberate implicit attitudes can give a clearer picture of the particular deviant behavior<sup>[20]</sup>.

## 3. Conclusion

In conclusion, it is advised to remain optimistic that neuroscience will revolutionize organizational research in ways that cannot be fully anticipated at this point. These advances will certainly occur in both theory and practice. It will not only help in addressing issues like deviant behaviors but will cater to almost every aspect of a running organization. For this, the researchers should explore as much as they can in this field of study and empirically establish the contributions of neuroscience in organizational setups. This would also help in addressing some of the challenges regarding OCN, although a lot of them have already been dealt with. The current study was able to review available literature on OCN and establish that knowledge from neuroscience can add to, if not completely, help in mitigating counterproductive behaviors prevalent in organizations. Future researchers are provided with a research agenda with extremely promising implications that can benefit not only the theory but also practically contribute to various industries across the globe.

## Author contributions

Conceptualization, MAZ; methodology, MAZ; validation, MAZ and AM; investigation, MAZ and AM; resources, NMQ; writing—original draft preparation, MAZ; writing—review and editing, AM; supervision, NMQ. All authors have read and agreed to the published version of the manuscript.

## Conflict of interest

The authors declare no conflict of interest.

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