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Seeds of Science

# Trauma Exposure across the News Cycle and the Case for Biotypes of PTSD in War Journalists

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## Abstract

This study examines the pervasive nature of trauma exposure in journalism and its impact across all stages of the news reporting cycle. Drawing from a comprehensive literature review, we highlight the significant gap in research on the neuroscience of journalism and journalist PTSD, despite the high prevalence of PTSD among war correspondents and photojournalists. We present a conceptual framework illustrating how primary and secondary trauma exposures occur during news gathering, reporting, and consumption phases. The study also reviews empirical findings on PTSD's effects on brain structure and function, identifying symptom subclusters and their associated brain regions. This knowledge informs the development of biotypes for more personalized and effective treatment strategies for journalists with PTSD while also emphasizing an urgent need for comprehensive support systems for journalists. This interdisciplinary approach uniting research in journalism, neuroscience, psychology, and organizational management, also advances the understanding of trauma in journalism and its broader implications for news consumption and societal trust in media institutions. Interventions that can support journalists' mental well-being can also enhance the quality of news reporting and contribute to a more resilient and informed society.

## Introduction

A journalist's job is to tell stories, whether good or bad. Trauma is an underappreciated aspect of journalists reporting on tragic events and relaying this news to audiences (Hill, 2018). Trauma that originates from a direct source is called primary trauma, while "the spread of negative emotional and cognitive states from those who are traumatized to those who have close contact with these individuals" is known as secondary trauma and is much less appreciated, both in the journalism mental health literature as well as the

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PTSD literature more generally (Motta, 2023). It is important to examine the role of both primary and secondary trauma in journalism, not only in journalists but at all steps of the news cycle. Understanding PTSD in journalists and general consumers of news therefore not only requires understanding where trauma exposure occurs across the news ecosystem but also a dedicated effort to better understand causes and effects of PTSD in this population to help journalists, especially war journalists and war photojournalists, but also the audiences they serve, to have better mental health outcomes and to improve journalism as a profession.

## Trauma is involved in all steps in the news cycle

Table 1 conceptualizes the news reporting cycle in the context of primary and secondary trauma exposure. As Table 1 demonstrates, trauma exposure can occur at all three phases of this news reporting cycle, making the case for investigating the traumatic exposure of not only journalists in reporting news but potentially, audiences consuming news content.

| | **News Gathering** | **News Reporting** | **News Consumption** |
|---|---|---|---|
| **Phase of News Reporting Cycle** | Early | Mid | Late |
| **Key people involved** | Journalist, Primary sources | Journalist, Editor | Audience |
| **Risk for trauma exposure** | Experiencing trauma and learning about it from sources | Traumatic content in the news story or stories to be produced | Traumatic content of the produced news story |
| **Trauma exposure involved** | Primary exposure (e.g., witnessing or experiencing a traumatic event), secondary exposure (e.g., hearing about a traumatic event from others) | Secondary exposure | Secondary exposure |

*Table 1. Conceptualizing trauma in the news reporting cycle*, per the work of Shah et al. (2020), Hill et al. (2018), Motta (2023), and Dubberley (2020).

The management structure for journalists, which typically has a hierarchical structure with journalists reporting to various levels of editors, creates opportunities for all involved in news production to develop secondary or even primary PTSD. A study of local journalists reporting on the 1995 Oklahoma City Bombing, Hill (2018) found that organizational leaders can identify trauma reactions of journalists, and may even become victims of secondary traumatic stress when journalists are assigned to cover a primary trauma such as war or terrorism. Even newsroom journalists who are not out in the field experience repeated exposure to traumatic news (Shah et al., 2020). While in the aftermath of the Oklahoma City Bombing, counseling, leadership, and social support increased for journalists, training has not changed in the nearly 30 years since the tragic event (Hill, 2018). Studying PTSD in journalism is a small community of practice, collecting more and more evidence that journalists and newsrooms face unique challenges when reporting on difficult events such as war, natural disasters, or terrorism. Furthermore, the trauma they are exposed to and report on can be further passed down the line beyond journalists and newsroom management to the communities served, as is discussed next.

## Studies on the neuroscience of journalism and journalist PTSD are scarce

While a vast literature has documented the effects of stress and anxiety on the brain, few studies have examined the neuroscience of journalism consumption, let alone journalist PTSD, specifically. Studies on the effect of news consumption on the brain are scant but reveal news consumption's clear effects on behavior, cognition, and decision-making and help explain why people may "doomscroll" or read "clickbait" articles (Dan et al., 2020; Li et al., 2021; Wei et al., 2022). Researchers have also examined the role of stress in news consumption in a very limited context. A study of doomscrolling of COVID-19 news in the pandemic found that greater exposure to COVID-19 news was associated with more stress about COVID, greater depression and anxiety, and increased drug use as a coping mechanism (Dyar et al., 2024). Another study found that women exhibit greater signs of stress reactivity than men after reading bad news (Marin et al., 2012). More recently, Shabahang and colleagues (2024) discovered that doomscrolling evokes existential anxiety in both the United States and Iran.

Further work is needed to determine in what ways the neuroscience of news gathering and reporting is similar to or different from that of news consumption. Only a handful of studies have examined journalism's effect on journalists, though the existing evidence

suggests that PTSD is an underreported problem among practitioners. Jukes (2017) terms the phrase “affective journalism,” rooted in neuroscience and referring to “affective processes, behaviours and practices that lie at the heart of journalists’ work when covering traumatic news stories.” Jukes (2017) learns that wartime journalists must work to actively distance themselves from the traumatic events they are covering as a buffer from ill effects.

Feinstein et al. (2002) note that war journalism is “a hazardous profession,” with PTSD rates matching those of combat veterans, adding, “despite the risks inherent in reporting war, we could find no research on the psychological health of war reporters.” This is echoed by Marais and Stewart (2005), who suggest that journalist temperament contributes to development of PTSD. A 2023 study of East African journalists (Radoli, 2023) found that trauma visuals can contribute to escalation of journalist PTSD.

War photojournalists are particularly vulnerable to PTSD. A study of photojournalists assigned to cover traumatic events by Newman et al. (2003) revealed that those assigned to photograph a greater number of traumatic events experienced greater distress. Jonisová (2022) writes about the negative impact of war photography on photojournalists’ mental health, as it brings them closer to the primary trauma source, “risking their lives to bring us a visual testimony directly from the battlefront.”

A small, dedicated community of practice, both dedicated to training journalists better and advancing the research on trauma and journalism, is emerging to help journalists better cover such events while advancing pedagogical approaches that protect journalist mental health. This highly interdisciplinary work unites scholars in journalism training and education, neuroscience, psychology, organizational management, and more. The Journalism Education and Trauma Research Group - North America (n.d.), a group of researchers dedicated to understanding the role of trauma in journalists’ lives, held its first symposium, titled “On Sacred Ground,” in 2024. The Columbia University Dart Center for Journalism and Trauma (n.d.) unites journalists and trauma researchers, including neuroscientists studying post-traumatic stress disorder, to help journalists grapple with reporting on tragic events.

This work may also provide insights into the neural underpinnings of primary and secondary trauma; empirically validate non-stereotypical traumatic experiences; and improve PTSD treatments by considering lived experiences of people not stereotypically associated with PTSD, given that trauma occurs on a spectrum, and its neurobiological effects can be observed on a spectrum as well (Stark, 2015). Studying journalist PTSD and the downstream effects of traumatic news reporting for consumers of news could also have broad social implications for our interactions with news institutions and the

work of building trust with news audiences, given that links are emerging between PTSD and social dysfunction and trust (Winkeler, 2023).

## Empirical findings of PTSD effects on brain structure

About 6-7% of the population will meet the criteria for PTSD in their lifetime, with those experiencing traumatic events most likely to develop PTSD. Individual, trauma-focused therapies are most effective to treat the disorder; those who are unable to access trauma-focused therapies can also benefit from “symptom reduction” using selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) (Schrader and Ross, 2021). Different types of PTSD may benefit from different therapies. For example, individuals with comorbid PTSD and major depressive disorder (MDD), in a randomized clinical trial of exposure therapy, benefitted more from virtual reality exposure therapy than prolonged imagined exposure when either was combined with d-cycloserine, an antibiotic used as a partial NMDA agonist to boost the effects of exposure therapy (Difede et al., 2022).

Understanding the neurobiology of PTSD and its many different combinations can help answer empirical questions and create more effective treatments, especially given the heterogeneity of PTSD and may have implications for persistence of various symptoms post treatment (Ringwald, 2024; Ringwald et al., 2024). There are 20 symptoms defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM V) which, when combined, create 636,120 unique symptom combinations (Galatzer and Levy, 2013). Common comorbidities of PTSD include anxiety and depression (Spinhoven et al., 2014) as well as a higher risk of being diagnosed with a substance use disorder (Goldstein et al., 2016). A large study in the US found that 44.6% of people living with PTSD also struggled with alcohol use disorder (AUD) or substance use disorder (Simpson et al., 2019). AUD and SUD have also been linked to specific features of the disorder, such as dissociation (Najavits and Walsh, 2012) and dysphoria, which can include hyperarousal and emotional numbing symptoms (Biehn et al., 2015). PTSD has demonstrated effects on brain function, structure, and biochemistry (Harnett et al., 2020) which are increasingly well-understood.

Trauma exposure can also create neurobiological signatures without a diagnosis of PTSD, and these signatures can vary. Table 2 (appendix) lists symptom subclusters derived from the underlying structure of PTSD (e.g., Elklit and Shevlin, 2010; Krause, et al., 2007) which are differentially associated with different brain regions, not only in PTSD but also in cases in which trauma exposure has happened but symptoms are below the threshold for a PTSD diagnosis. This is consistent with the idea of a trauma

spectrum (Stark, 2015) on which both journalists and consumers of news experience primary and secondary trauma at varying levels. While the exact functions and roles of each brain region are outside the scope of this article, it is notable that differences in brain structure exist between different subclusters of symptoms, lending evidence to the idea that symptoms of PTSD, which often overlap with those in anxiety and depression, may lead to unique neural signatures (Tozzi et al., 2024).

## The case for PTSD biotypes in war journalism

Reflecting on the diversity of experiences in living with PTSD, and their potential neurological effects, can lead to the establishment of biotypes in which PTSD patients differ on symptoms, behavioral and cognitive performance, and response to medications and treatments (Tozzi et al., 2024). Such biotypes can help those living with PTSD obtain more tailored treatments and help them live better lives, as well as advance the science of trauma and potentially, better illuminate its role in our daily lives as consumers of news.

Journalists are trained to tell stories, so talking to journalists about their traumatic experiences may also support their posttraumatic growth by helping with the establishment of a trauma narrative (van Der Kolk, 2022). Talking to war journalists about their PTSD symptoms, treatments, and other aspects of living with PTSD can help define biotypes that can be further examined using neuroimaging to understand the full range of PTSD lived experiences with implications for treatment and recovery. War journalists are the population of journalists that are most likely to develop PTSD. Feinstein et al. (2002) found not only that war journalists and combat veterans had similar levels of PTSD, but that war journalists scored higher on depression and PTSD measures, and self-reported drinking more alcohol, compared to other journalists. Despite the risks, journalists may not be informed about emotional impacts of this work, and may have inadequate access to mental health resources such as counseling (Newman et al., 2003).

Furthermore, biotypes of PTSD may differ between people actively fighting in a combat zone and those there to report on it. For example, the locus of control may differ between combat veterans and war journalists, and research shows that those with a higher external locus of control are more likely to develop PTSD (Güzel et al., 2024). A combat veteran may have a high internal locus of control, believing that their work can improve the lived experiences of local people, as Marcus Luttrell did as a Navy Seal, as detailed in his memoir *Service: A Navy Seal at War* (Luttrell and Hornfischer, 2014). Journalists, as observers, may have different loci of control. A former Iraq war journalist

I interviewed stated that he did not feel his objectives as a war journalist, on the other hand, were accomplished, and that he felt shame for being among people who did not have a choice to be in a war zone.

Lastly, biotypes may differ between war journalists themselves. In the next section, I detail the PTSD symptoms of two war journalists – both managers of a large journalistic organization in Iraq during the height of the insurgency in the Iraq War – who live with vastly different PTSD symptoms. One has greater re-experiencing symptoms, while the other has greater hyperarousal symptoms. Research shows that hyperarousal and re-experiencing have opposite effects on affective habituation, which is a phenomenon that occurs when one is repeatedly exposed to a traumatic stimulus, as measured by functional magnetic resonance imaging. McCurry et al. (2020) looked at affective habituation in combat veterans and found that hyperarousal and re-experiencing symptoms engaged different brain circuits in affective habituation. In the study, hyperarousal symptoms linked to decreased habituation to negative stimuli in areas of frontal and temporal gyri, ventromedial prefrontal cortex and anterior insula. On the other hand, re-experiencing symptoms were linked to increased affective habituation towards negative stimuli in a similar set of brain regions. More research is needed to better understand PTSD biotypes, and talking to war journalists can be an important step forward towards a better understanding of the disorder.

## Looking to war journalists' lived experiences for clues about PTSD biotypes

"Post-traumatic stress disorder isn't just for soldiers. After years of covering war and tragedy in the Middle East and Southeast Asia for Reuters, it happened to me," says Dean Yates, a journalist turned workplace mental health expert and public speaker who was diagnosed with PTSD in 2016 (Yates, 2016). He describes his diagnosis as "plunging into an abyss" (Yates, 2016). "It's hard to stop falling when you don't understand why you fell in the first place," he writes in his memoir, *Line in the Sand*. "After my diagnosis, I felt no emotion, nothing. I had a name for my condition, but no relief" (Yates, 2023, p. 28).

Yates spent 26 years at Reuters, serving as bureau chief in Iraq. He later served as their head of mental health strategy from 2017 to 2020. Yates is a workplace mental health expert, public speaker, podcast host and journalist. He is an outspoken advocate on mental health, press freedom and government accountability. In his book, *Line in the Sand,* he details his experiences working as Bureau chief in Iraq during the war. "As bureau chief of the largest foreign news organisation in Baghdad, I fear for the safety of

my staff more than anything" (Yates, 2023, p. 4), Yates writes. Journalism staff not only died as a consequence of the wartime military operations but were also deliberately targeted by terrorists during his tenure.

All of it is just another day at work for Yates, who says of the journalists' deaths, which he wrote a story about for Reuters: "Of course, this is news. More emails arrive asking the same question. All my foreign colleagues wait until I write a five-paragraph story before reporting the event. This makes it real, not a nightmare. Doing something I've done thousands of times for Reuters across Asia and the Middle East for fifteen years" (Yates, 2023, p. 11). Doing something he loves allows him to say "focused," as he writes in his book: "More precisely, the work, the responsibility I carry, stops me falling apart" (Yates, 2023, p. 11).

Work became a survival mechanism and way of life for Yates, but the trauma eventually started to catch up with him. At one point, he asked his editors if he could leave the reporting zones to work remotely, which they accepted. Then, he began having intrusive reminders of the various events he'd experienced, forcing him to work less. "Dozens of sights and sounds began intruding into my head," says Yates of his PTSD symptoms: "intermittent at first, frequent now" (Yates, 2023, p. 24). He also has nightmares: "Even when I'm not being pursued in my sleep, the scenes are always violent. [...] I'm in Iraq or elsewhere in the Middle East. People I know sometimes appear, usually journalists" (Yates, 2023, p. 41). Yates, who also reported from Banda Aceh, Indonesia, during its tragic 9.5-magnitude earthquake, continues: "I also show up in Indonesia or Australia. Then there is lots of water, flooding. I must flee or drown" (Yates, 2023, p. 41).

To deal with his symptoms, Yates says he self medicated codeine, Xanax, and alcohol, though his psychiatrist urged him to rest. "Problem is – on sick leave and therefore free of editing copy, writing emails and taking part in daily news-planning calls – my mind has declared war on itself" (Yates, 2023, p. 41). Yates describes a lack of support from Reuters, such as no "internal peer network of journalists who support distressed colleagues" (Yates, 2023, p. 42). "It's like I don't exist," he writes (Yates, 2023, p. 42).

Even prior to his diagnosis, spending years covering wars and catastrophes around the world, Yates struggled with normal life. His book portrays him as sensitized to a life of chaos and trauma, drawn to "newsroom noise, the pull of a big story," even on the occasion of the birth of his child with his partner, a fellow journalist (Yates, 2023, p. 30).

"I don't know anyone who has worked in war zones as a journalist who has not been damaged by it," says a war journalist to whom I spoke that preceded Yates as Reuters Baghdad Bureau chief. However, his symptoms, as he describes them in his own

words, are a bit different. While Yates struggles with reexperiencing symptoms, his anonymous colleague was diagnosed with both PTSD and attention-deficit hyperactivity disorder or ADHD. Luderer et al. (2020) found that ADHD was associated with a higher risk for traumatic events, self-reported PTSD, and higher severity of PTSD patients with alcohol dependence.

The anonymous bureau chief developed substance abuse problems, especially with alcohol, when he began self-medicating to help his brain stop “racing around” and “as a way to focus.”

“In a way, it worked, at first, because I was able to calm my brain and write much better for a while, but because I was using increasing amounts of alcohol, it escalated, and then I was going through withdrawal. I wasn’t drinking to write, I was drinking to not go through withdrawal,” he says. He was able to stop drinking, and realized that he could never drink again because it would put him back into the same cycle.

His PTSD is, in his words, “a little bit complex because I’ve been in personal danger a whole bunch of times. I’ve been in a helicopter that was shot down, I’ve been bombed, I’ve been shot at, but as far as I know, none of those incidents really traumatized me, and I don’t think they caused me any harm. What I think caused me the harm was that…I was in charge of all journalists in the Middle East which included Iraq, Iran, Sudan, Yemen, all these war zones and the constant stress of that, I think, kind of wore me down.”

Dangers journalists face in warzones both relate to their own survival and that of their colleagues. While the unnamed war journalist woke up to the sound of bombs daily, he “just kind of got used to it…you just kind of learn to ignore it.” What he cites as contributing to his PTSD is having to account for others in the warzone. Because terrorist groups in the region targeted foreign journalists, the Bureau had to work with local Iraqi journalists to do reporting.

“All day I'd be just on edge just worrying about them and worrying about their safety, and I only ever really relaxed about 11 pm at night, when I knew all the cars were back safely. And I could kinda relax. And this went on for two years. And so I think part of you know, the damage that was done to me is mainly just this attritional tension and stress, day after day, not really worrying about myself, but worrying about other people. So I think that kind of wore me down,” he says. He and Yates were also affected when two of their colleagues were killed by a United States military helicopter, the details of which were released by Wikileaks. Eventually, the anonymous journalist says, he got to a point where, when he would hear loud bombs in the middle of the night, he would just go

back to sleep. He notes that his colleagues did, too. “That was kind of a sign for me that I’d crossed a line into a different kind of thinking, where I can be bombed and just go back to bed and think it’s normal,” he said.

A few aspects of PTSD in journalism are “a bit different and interesting” to the anonymous war journalist:

(1) **Most journalists will never want to say they have PTSD and are ashamed about it because they volunteered to go to the war zone.** When war journalists go into a war zone, it is by choice, and often they have fought hard to get there “because it’s good for your career,” he says.

(2) **“You’re reporting on people who don’t have a choice. They are stuck there.”** The people living in warzones did not get to choose to be there or not, says the war journalist. However, journalists can call their editor at any time and quit. “That creates a sense of shame, I think, for journalists when they are affected by PTSD. You feel like, ‘Oh, what right do I have to have become ill from this?’ Other people who have no choices are having to go on with their lives. So that’s one reason journalists deny [that they have PTSD].”

(3) **Vicarious trauma can play a large role.** The unnamed war journalist said that the most damaging thing for his mental health was seeing his colleagues go into danger. He was not as worried about himself and didn’t himself face any real danger, but found “just seeing the awful consequences for others” damaging.

(4) **Related to PTSD is the idea of “moral injury”** which the National Center for PTSD (n.d.) describes as “distressing psychological, behavioral, social, and sometimes spiritual aftermath of exposure to such events.” The unnamed war journalist describes it as “a disease of your soul” in which the things you see that are “morally indefensible … can make you a bit unwell. It’s part of the whole story,” he says. He relates a quote from *Dispatches* by war journalist Michael Herr: “What I didn't know, and it took the war to teach me, was that you're not only responsible for the things that you do. You're also responsible for the things that you see.’” When you witness events in a war zone, he says, even if “you didn't cause it, and it wasn't your fault, you do feel a sense of moral responsibility, and it does harm your mental health.”

## Conclusion

Journalism exposes its practitioners and consumers alike – especially on issues such as wars, disasters, and terrorist events – to trauma. Research shows that journalists, especially wartime journalists, including photographers, face PTSD rates similar to combat veterans. Despite this, there is a critical lack of mental health support and resources for wartime journalists and their newsrooms. Research on the neuroscience of journalism and journalist PTSD is limited, despite extensive literature documenting stress and anxiety's effects on the brain in other contexts. The few available studies paint a picture of traumatic news coverage that leads to adverse behavioral and cognitive outcomes not only in journalists but in consumers of news as well.

Because journalists are natural storytellers, looking at their experiences can also help develop biotypes of PTSD which may differ in terms of symptoms, treatments, and neurobiological substrates. Empirical findings on the neurobiology of PTSD provide a basis for developing better treatments based on such biotypes. One step forward towards a biotype may involve identifying symptom subclusters and looking at the brain regions associated with them to gain insight into PTSD's underlying neural mechanisms. This knowledge, combined with individual symptom profiles and treatment responses, can inform the development of biotypes for more personalized interventions, helping not only journalists but all people living with PTSD.

Understanding the neurobiology of PTSD in journalists is crucial for developing tailored treatments and support systems, ultimately improving both journalist well-being and the quality of news reporting. War journalists' experiences underscore the urgent need for comprehensive support systems throughout the news ecosystem. By recognizing journalists' unique challenges and leveraging neuroscience and psychology insights, scientists and clinicians can develop more effective interventions, and the pedagogy of journalism can be improved to support mental health capacity-building in the newsroom. This approach can enhance news reporting quality and contribute to a more resilient society.

# Gardener Comments

**Andrew Neff (Ph.D. Neuroscience):**
I can see value in replacing DSM diagnostic categories & generic symptoms with more specific symptoms & symptom-clusters that were defined with feedback from people with lived experience. New sub-categories of PTSD could inspire the development of new psychotherapies or social interventions, and incorporating new symptoms checklists could be built into machine learning models to better predict individualized treatment response (likely alongside fMRI and other measures). To be convinced of the value of this approach, you need to accurately predict treatment response, but also need to create a system that increases the total number of people treated.

The one thing I don't think will work out is using neuroimaging to identify biological intervention targets, insofar as 1) fMRI voxels are ambiguous summaries of ~10,000+ neurons, and 2) non-invasive stimulation technology is even less precise and generally unable to target more than one region at a time. Even if we had better interventional tech (like surgically implanted electrodes), of the brain's infinite properties, I am doubtful that manipulating fMRI voxels is a powerful and specific lever, and historically we haven't had many (...any) successes with this approach.

**Ben Curtis (Photojournalist, Nieman Fellow):**
This article provides a broad look at the latest research into the role of traumatization in news reporting and photojournalism and aspects of the neuroscience involved, making the case for treating trauma experienced through such work, especially conflict reporting, as a specific biotype of symptoms and causation.

Despite the high prevalence of PTSD in these individuals there is a relative paucity (with some notable exceptions) of research specific to them, and so this article is very welcome.

**George (psychologist):**
This is perhaps the most tentative yes I've given to one of these and I think I'm very much on the fence with whether or not I actually like this paper, especially in its current form.

I believe this is a novel area (to my limited knowledge of clinical psych) and I think its focus on PTSD in war journalists is super interesting. However, I am very sceptical of the theory behind this paper and use of neuroscience to justify further categorisation of maladpative behaviour even more than the DSM-5 already does.

I do not know anything about biotypes and I have never heard the term before, but from the current writing I struggle to believe in their worth in this analysis. The neuroscience of PTSD is mentioned briefly and clusters of behaviour displayed by different people

with PTSD. But I feel like the analysis only really describes individual experiences rather than something like a factor/ cluster analysis of PTSD symptoms. The analysis which is presented is a bit like a thematic analysis in the presentation and summary of your data. If this is to be published, I think a mixed-media thematic analysis of war journalists' shared experience would be a very cool way to go with the data you've presented. I struggle with the neuroscience part of the PTSD biotypes as without brain scans etc., I really don't know what lived experiences can really tell you about the brain, so a behavioural idiographic approach to this analysis not only makes more sense but seems a bit more theoretically coherent. I would prefer it greatly if you moved theory onto something like process-based therapy which focuses on the behaviour symptoms and lived experiences of people with PTSD, but I'm sure any clincal theory of behaviour will add some structure and merit to your discussion.

**Allen Arthur (Director of engagement at Solutions Journalism Network, freelance journalist):**
I believe this is an important tangle of issues to pursue for the health of media, democracy, and our communities. While potential PTSD in journalists may seem niche, the reality is that the seemingly endless cycle of reporting primarily on the world's worst and most devastating incidents is profoundly deteriorating the mental health and well-being of journalists. This, in turn, has led them to be less curious and more burnt out, along with producing an unfortunately (though understandably) cynical and hopeless worldview that filters into their reporting. That has negative effects on the fabric of our communities in a variety of ways we are just starting to understand, including perpetuating that cynicism and hopelessness among news consumers. The far-reaching effects of trauma on those tasked with helping others understand the world shouldn't be underestimated and deserve much more study.

**Anonymous 1:**
The writing is quite good. The text was easy to read and the topic was presented in a straightforward way with organized evidence. I did not feel there was a compelling argument for why war journalists' PTSD subtypes need to be or should be studied rather than studying PTSD subtypes generally. However, I recommend publication because it was intriguing to see these ideas combined this way, and a compelling case is made that the study of war journalists' PTSD *could* provide insight and better outcomes.

**Oswell Moyo (Media and Communication Researcher, MPhil Media and Society Studies, Bsc Journalism and Media Studies):**

*Does the article contain novel ideas that have the potential to advance science?*

This article brings into fore novel ideas about important but neglected Biotypes of PTSD in War Journalists. The article comes at a time when the world is getting polarized and rooted in economic wars fronted by the largest economies, namely the United States of America and China. At the time of writing, Russian- Ukraine war, Israel and Palestine Conflict, unending African conflicts in the SAHEL Region, Democratically Republic of Congo and Mozambique conflicts are at the centre stage with the need for research on

the neuroscience of journalism and journalist PTSD. This article has potential to advance interdisciplinary discipline of science within the field of journalism studies, psychology, medicine and war studies.

*Comments*

Contextualization (background to the problem, rationale for the research, problem identification, objectives of the study)

- The title of the article can be expanded into more detail. It is too narrow. The reader must be given a glimpse of the geographical location of the study. I Am sure you are aware that experiences of war journalists in Ukraine can be different from those in DRC hence I suggest a slight change of title. The researcher can rewrite the title like this “Examining Biotypes of PTSD amongst journalists covering war in Global North.”
- Kindly expand on the following point “the management infrastructure for journalists is lacking” What exactly?
- Kindly include scholarly reference to buttress this point, “While in the aftermath of the Oklahoma City Bombing, counseling, leadership, and social support increased for journalists, training has not changed in the nearly 30 years since the tragic event.”
- Is it possible to give a brief background in the introductory section? What motivated you to undertake the study? How many journalists have been affected? Kindly touch on those.

*Discussion (contribution of scholarship- the core of study)*

The study definitely contributes to scholarship in both the area of journalism, psychology and neuroscience. The discussion can be thickened by bringing in theory and comparing it with similar studies. I am impressed by thick qualitative raw data that is informative.

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## Appendix - Table 2

| PTSD Symptom Subcluster | Symptom | Brain region | Peer-reviewed research studies |
|---|---|---|---|
| **Avoidance** | Anticipating aversive stimuli<br>Detecting threats<br>Fear generalization | Insula | Jeong, et al., 2019<br>Nutt & Malizia, 2004<br>Michaels, et al., 2021 |
| | Fear expression | Cingulate Gyrus | Milad, et al., 2009 |
| **Intrusions (Re-Experiencing)*** | Emotional and somatic aspects of memories; integrating trauma-unrelated information with traumatic memories | Amygdala | Nutt & Malizia, 2004<br>Brenner, 2011<br>Simmons, et al, 2008 |
| | Flashbacks (Kroes et al., 2011); "Volitional and avolitional allocation of attentional resources during the retrieval of episodic memories" (Brenner, 2011) | Insula/Parietal Operculum | Kroes et al., 2011<br>van Rooij, et al., 2016<br>Brenner, 2011 |
| | Flashbacks | Inferior Frontal Gyrus | Kroes, et al., 2011 |

| | | | |
|---|---|---|---|
| | Manipulating emotions and memories; attention and pain; processing cognitive and emotional interactions, including from emotional stimuli | Anterior cingulate cortex | Brenner, 2011<br>Hopper, et al., 2007 |
| | Gating of sensory input | Locus coeruleus and thalamus | Brenner, 2011<br>Nutt and Malizia, 2004 |
| | Oculomotor control (e.g. in Eye Movement Desensitization and Reprocessing or EMDR) and motor planning | Motor thalamus | Casteen et al., 2022 |
| | Decreased memory function; deficits idenfying safe contexts; greater re-experiencing symptoms | Hippocampus* | Rosso et al., 2017<br>Henigsberg, et al., 2019<br>Stark et al., 2015<br>Kroes et al., 2011 |
| | Conscious and non-conscious threat processing | Basal ganglia* | van der Kruijs et al., 2014<br>Stark et al., 2015 |
| | Greater re-experiencing symptoms | Inferior Occipital Cortex | Kroes et al., 2011 |
| **Dysphoria*** | Reward networks | Basal ganglia* | Stark et al., 2015 |
| **Hyperarousal*** | Hypervigilance to threat cues | Medial prefrontal cortex*<br>Amygdala* | Stark et al., 2015<br>Nutt and Malizia, 2004 |
| | Physiological arousal - modulating attentional, sensory, and | Thalamic nuclei | Casteen et al., 2022 |

| | | | |
|---|---|---|---|
| | cognitive functions | | |

**Table 2.** *Symptom subclusters and relationship to brain structure based on prior literature.* A single asterisk (*) indicates potential brain-symptom association related to trauma exposure and potential subthreshold PTSD symptoms, not specifically diagnosed PTSD.