

# Disturbing Images: Processing What you Cannot Delete

Kathryn C. Seigfried-Spellar, PhD  
Associate Professor  
Department of Computer & Information Technology  
Purdue University  
West Lafayette, Indiana USA

## Forum Outline:

1. Current state of digital evidence & digital forensics
2. Understand the existing research on the well-being of digital and multimedia forensic analysts
  - Testimonials
3. Raise awareness about the concept of secondary traumatic stress or vicarious stress
4. Discuss current attitudes toward mental health services

## The evidence has changed.

Now almost every type of criminal investigation involves some form of digital evidence (Clifford, 2011).

Digital devices have changed the crime scene.



DEPARTMENT OF COMPUTER  
& INFORMATION TECHNOLOGY

## More digital evidence of the actual crime itself than ever before.

Digital forensic examiners often enhance audio, video, and image evidence to identify the actors or clarify the context of the situation.

All of which may involve repeatedly viewing and hearing heinous acts.

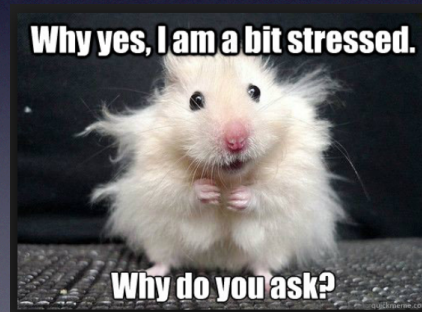
“Digital forensic examiners are exposed to the worst that the world has to offer - all in high resolution photo or video formats” (Irvine, 2010).

DEPARTMENT OF COMPUTER  
& INFORMATION TECHNOLOGY



## Criminal justice occupations are associated with high work-related stress.

Poll: How symptoms are associated with stress?



## Secondary traumatic stress manifests from indirect exposure to trauma.

Secondary traumatic stress is sometimes referred to as vicarious traumatization.

Poll: Does STS manifest after exposure to a single case or is it due to a “cumulative” level of trauma?

## STS symptoms are similar to PTSD.

Criterion A: *Stressor* (direct or indirect exposure)

Criterion B: *Intrusion symptoms* (e.g., nightmares)

Criterion C: *Avoidance* (external reminders, thoughts or feelings)

Criterion D: *Negative alterations in cognitions or mood* (feeling isolated)

Criterion E: *Alterations in arousal and reactivity* (irritable, hypervigilance)

Symptoms last for 1 month and significant social/occupational distress.

## Burnout is an occupational hazard.

There are three components (Malach & Jackson, 1981):

1. Emotional exhaustion
2. Depersonalization
3. Decreased personal accomplishment

**Question:** In your experience, what are the causes of burnout?

Burnout is caused by organizational factors rather than exposure to trauma (American Institute of Stress).

- Job satisfaction matters.

## Mental health is a state of emotional, behavioral, and social well-being.

“It is not just the absence of mental disorder... but how we can cope with the normal stresses of life” (WHO, 2018).

Psychological symptoms: depression, anxiety, suicidal thoughts, hypersensitivity, vigilance, concentration, worthlessness, anhedonia, etc.

Coping mechanisms: distraction, substance use, withdrawal, counseling, talking with others, exercising, eating too much/little

## A lot of research exists with child exploitation investigators.

Only recently are we seeing research emerging with digital and multimedia forensic examiners.

**Poll:** What is your primary job duty:

- Digital forensic examiner-only
- Investigator-only
- Both the examiner and investigator



## Digital forensics is often completed “in house” unlike other forensics.

Work-related stress is further complicated due to multiple roles.



## Multimedia forensic analysts

Past research focuses on exposure to child sexual exploitation material (CSEM), but stress can result from working a wide-range of traumatic events.

What are the impacts of enhancing audio, image, and video evidence for a wide-variety of cases?

Do audio vs. image vs. video analysts experience different symptoms from work-related stress?

## Seigfried-Spellar et al. (2019)

The current study compared multimedia forensic analysts (audio, video, vs. image) to:

1. Identify availability and attitudes toward counseling services.
2. Explore differences in psychological health and well-being.
3. Explore differences in coping mechanisms.
4. Explore differences in job satisfaction.

## Seigfried-Spellar et al. (2019)

Final dataset included 136 respondents; majority reported *currently* performing multiple roles:

- 67 audio analysts
- 126 video analysts
- 68 image analysts
- 27 also worked as a detective/investigator

## Mental health support

**Poll:** Do you think mental health services should be mandatory?

- No, Yes, Indifferent



## Mental health support

15% sought counseling.

When asked if counseling should be required:

- 35% said No
- 28% said Yes
- 37% were Indifferent

Analysts with an image role were significantly more likely:

- to know someone who has sought counseling
- also personally seek counseling



## Secondary Traumatic Stress

28% of the sample met the diagnostic criteria for having STS.

No significant difference between groups on number of individuals meeting the STS diagnostic criteria.

Differences between reported stress for various traumatic events based on type of evidence (image, video, or image).

Trauma	Type of Evidence		
	Audio	Video	Image
Suicide	59%	61%	60%
Beheading	62%	72%	70%
Assault	75%	73%	70%
Rape	83%	86%	82%
Torture	78%	86%	85%
Homicide	73%	74%	66%
Active Shooter	64%	69%	68%
Police Shooting	79%	80%	72%
Animal Abuse	74%	76%	77%
Child Abuse	89%	92%	90%
Elderly Abuse	83%	79%	84%
Someone dying	80%	75%	66%

*Note.* Values represent % of respondents who found this traumatic event "stressful."

## Psychological well-being

Compared to individuals with no detective role, individuals with a detective role:

- More job satisfaction
- Less feelings of worthlessness, less anxiety, less worry, less issues with motor tension
- More positive affect

## Psychological well-being

Compared non-audio analysts, individuals with an audio analyst role:

- Less job satisfaction
- Experience more worry
- More motor agitation
- More suicidal thoughts
- More hypersensitive

## Psychological well-being

There were no significant findings when comparing psychological wellbeing and job satisfaction between:

- video vs. non-video analysts
- image vs. non-image analysts

## Post Hoc Analysis

**Individuals with a detective/investigator role scored highest on psychological wellbeing.**

However, we wanted to isolate those individuals who did not have a dual role as a detective/investigator.

Thus, we **removed** anyone from the dataset who also worked as a detective/investigator and re-ran the analyses.



## Post Hoc Findings

When we controlled for detective role, wellbeing changed for individuals with an image analyst role:

- More anhedonia,
- More feelings of worthless/guilt
- Increased motor agitation
- Increased motor retardation

No changes for audio or video analysts.

## Summary

Individuals with an audio role scored lowest on psychological wellbeing.

Individuals with a dual role as a detective had the best psychological wellbeing.

- This dual role appears to increase resilience for image analysts.
- Findings different for DFE with dual role for ICAC

## Summary

Image analysts more likely to seek mental health services.

Despite psychological distress:

- Only 15% sought counseling
- Only 28% thought counseling should be required

## What do we do next...

Digital evidence and disturbing media will continue to exponentially grow.

We need rigorous studies assessing prevention, identification, and treatment of distress within the digital forensics community.

Education is key - we need to be *vicarious trauma-informed*

- We need to change the narrative.

# Discussion

# Questions?

**Dr. Kathryn Seigfried-Spellar**

Associate Professor

Department of Computer & Information Technology

[kspellar@purdue.edu](mailto:kspellar@purdue.edu)