

9-1-1 TELECOMMUNICATION: DUTY-RELATED TRAUMA EXPOSURE AND MENTAL HEALTH OUTCOMES

Michelle M. Lilly, Ph.D.
Heather Pierce, B.A.



Northern Illinois University

Previous literature

- Very limited rigorous, empirical data on telecommunicators
 - Nothing on mental health
- What is available suggests that they experience significant duty-related distress
- How similar/dissimilar are TCs from other emergency responders and the general population?

Sample: Recruitment and enrollment

- Recruitment materials were circulated primarily using the Internet
 - Social media special interest groups (Facebook)
 - Message boards for professional websites
 - Personal contacts of Heather Pierce
 - "Snowballing"
 - Flyers were emailed and mailed to randomly selected agencies
 - Potential participants were issued a randomly assigned identification number and a link to access the study online
 - Paper copies were offered and mailed to those that requested this format
 - 300 participants were enrolled in the study with 171 completing the questionnaires

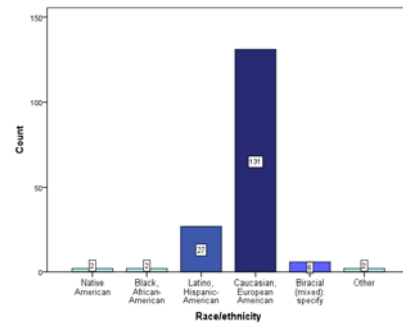
Our sample: Basic demographics

- 171 current telecommunicators
- 74% female ($n = 126$)
- Average age: 38.85 ($SD = 9.61$) years
- Average service: 11.85 ($SD = 8.16$) years

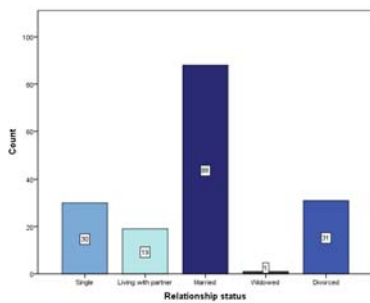
Sample: States

- 24 different states
 - Majority were from Midwest ($n = 76$) and Southwest ($n = 58$) regions
 - States represented:
 - Illinois, Iowa, Arkansas, Wisconsin, Ohio, Indiana, New Mexico, California, Texas, Florida, Arizona, New Jersey, New York, Tennessee, South Carolina, Virginia, Georgia, Montana, Oklahoma, Utah, Minnesota, Kansas, Michigan, and Pennsylvania

Sample: Race/ethnicity



Sample: Relationship status



Sample: What we don't know about basic demographics

- Rural versus urban
- Didn't differentiate between police dispatchers, call takers, fire dispatchers, etc.
- Didn't assess things about their particular work environment (multijurisdictional, other job-related duties, etc)
- Others? Any ideas?

Measures: Duty-related exposure

- Potentially Traumatic Events/Calls (PTE) (Troxeil, 2008)
 - Assesses 21 different types of calls, frequency, and distress
 - 15.32 (SD =3.50) out of 21 events
 - Experienced distress in reaction to 32% of the different types of events/calls
 - Said differently, if a participant reported having handled 15 different types of calls, they also reported experiencing intense fear, helplessness or horror in reaction to 5 of these types of calls.
- Limitations: only used twice empirically, can't capture every type of event, frequency of calls is difficult to assess (some types of calls are daily)

Measures: Peritraumatic distress

- Distress felt during and shortly after traumatic event
- Peritraumatic Distress Inventory (PDI) (Brunet et al.)
 - Developed using police officers
 - Respondents were asked to think about a work related event that they would consider their "worst" and rate the 11 items accordingly
 - Removed three items that didn't seem relevant
 - "I felt afraid for my safety"
 - "I had difficulty controlling my bowel and bladder"
 - "I thought I might die"
 - Internal consistency for present study: $\alpha = .86$

Measures: Posttraumatic Stress Disorder (PTSD)

- Posttraumatic Stress Diagnostic Scale (PDS; Foa)
 - Identify worst or index event
 - Immediate reactions (fear, helplessness, horror; injury; threat of death)
 - Symptoms (hyperarousal, avoidance, reexperiencing)
 - Time lapse, chronicity, interference with functioning
 - $\alpha = .85$ for symptom severity score

Measures: General mental health

- Symptom Checklist-90-R (Derogatis)
 - Whether they have been bothered by symptoms in the last week
 - Nine subscales: Depression, anxiety, somatization, hostility, psychoticism, obsessive-compulsive, interpersonal sensitivity, phobic anxiety, paranoid ideation
 - Norms based off different samples (inpatient, outpatient, male/female)

Study 1: PTSD, distress, duty-related exposure

- Some calls were more highly associated with intense emotions:
 - Unexpected death or injury of a child
 - Child sexual assault
 - Violent domestics
 - Calls involving friends and/or family
- Some were more frequently identified as “the worst”:
 - Calls involving children (injury or death)
 - Suicidal callers
 - Officer involved shootings
 - Calls involving the unexpected death of an adult

Study 1: PTSD, distress, duty-related exposure

- Comparison of PDI means from three samples (Brunet et al., 2001)
 - Scale: 0=not at all, 1=slightly, 2=somewhat, 3=very, 4=extremely true

	Officer	Civilian	911 TC
	(N=702)	(N=418)	(N=171)
	Mean (SD)	Mean (SD)	Mean
Felt helpless to do more	1.7 (1.4)	2.2 (1.4)	3.5 (1.4)
Felt sadness and grief	2.1 (1.5)	2.8 (1.4)	3.5 (1.4)
Felt frustrated, angry could not do more	2.1 (1.5)	2.7 (1.3)	3.5 (1.4)
Felt guilt more was not done	1.0 (1.3)	1.3 (1.4)	3.5 (1.4)
Felt ashamed of my emotions	0.4 (.9)	0.9 (1.3)	3.3 (1.5)
Felt worried about safety of those on scene	1.7 (1.5)	1.1 (1.5)	2.3 (1.6)

Study 1: PTSD, distress, duty-related exposure

- Comparison of PDI Means from Three Samples (Brunet et al., 2001)
 - Scale: 0=not at all, 1=slightly, 2=somewhat, 3=very, 4=extremely true

	Officer	Civilian	911 TC
	(N=702)	(N=418)	(N=171)
	Mean (SD)	Mean (SD)	Mean (SD)
Felt I would lose emotional control	0.7 (1.1)	1.6 (1.4)	1.5 (1.3)
Horrified by what happened	1.5 (1.5)	1.6 (1.5)	3.1 (1.7)
Had physiological reactions (sweating, shaking, pounding heart)	1.5 (1.4)	2.0 (1.5)	1.9 (1.4)
Felt I might pass out	0.2 (.8)	0.7 (1.2)	3.2 (1.6)
Average score	1.3	1.69	2.93

Study 1: PTSD, distress, duty-related exposure

- Rates of PTSD
 - General population 7%
 - Police Officers 7-19%
 - Firefighters 17-22%
 - Telecommunicators in our sample: 3.5%
 - Remember the disclosures from earlier!
 - Current PTSD symptoms, participants willing to complete the survey, duty-related event only, etc.
 - Strong possibility that this is an underestimate

Study 1: PTSD, distress, duty-related exposure

- Relationship between exposure and PTSD
 - $r = .21, p < .00$ (just exposure)
 - $r = .37, p < .01$ (exposure that has distress)
- Relationship between distress and PTSD
 - $r = .34, p < .001$
- Summary:
 - Increased levels of exposure to traumatic events and peritraumatic distress are related to increased levels of PTSD symptom severity

Study 2: Depression, PTSD, Cognitions and Distress

- Depression measured with Symptom Checklist 90 Revised (SCL-90-R)
 - Average score was .65 (SD = .68)
 - Approximately consistent with non-patients in the normed sample
 - Modal answer (the most common score) was 'O' (19% of the sample)
 - BUT – top quartile had scores that were 1+, suggesting moderate (and some cases, more severe) levels of depression

Study 2: Depression, PTSD, Cognitions and Distress

- What predicts symptoms of Depression and PTSD?
 - Peritraumatic distress (a strong predictor in previous research)
 - The theory of shattered assumptions (Janoff-Bulman, 1983) may be one theory that explains the link
 - Three fundamental assumptions about the world (benevolence of the world, meaningfulness of the world and worthiness of self) can be shattered in the face of trauma
 - Trauma can disrupt these assumptions, leading to a disintegration of an internal world that provides one with a sense of safety, meaning and self-worth
 - Measured with the World Assumptions Scale (WAS)

Study 2: Depression, PTSD, Cognitions and Distress

	1.	2.	3.	4.	5.	6.
1. WAS self worth	-					
2. WAS controllability	-.07	-				
3. WAS Benevolence of the world	.19*	-.03	-			
4. Peritraumatic distress	-.21**	-.13	.02	-		
5. PTSD symptoms	-.16*	.07	-.22**	.34***	-	
6. Depressive symptoms	-.20*	.09	-.19*	.36***	.65***	-

Study 2: Depression, PTSD, Cognitions and Distress

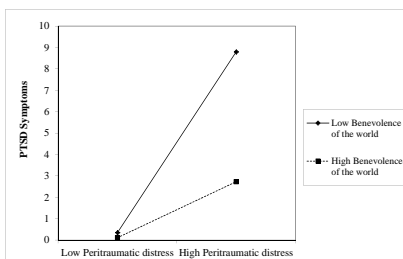
- What about the combined effect?
- Theory of world assumptions suggests that assumptions are shattered in the face of an event that fundamentally alters one's beliefs about the safety and meaningfulness of the world, as well as one's beliefs regarding one's self-worth
 - These events should be associated with reports of more peritraumatic distress

Study 2: Depression, PTSD, Cognitions and Distress

- Would expect that mental health would be most compromised for those with BOTH more peritraumatic distress AND subsequent changes in beliefs

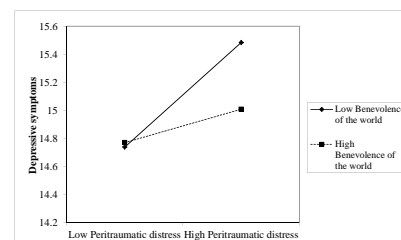
Benevolence of the world and PTSD

- Main effects: WAS, PDI



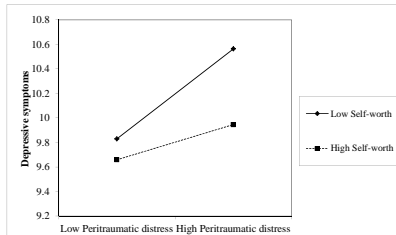
Benevolence of the world and depression

- Main effects: WAS, PDI



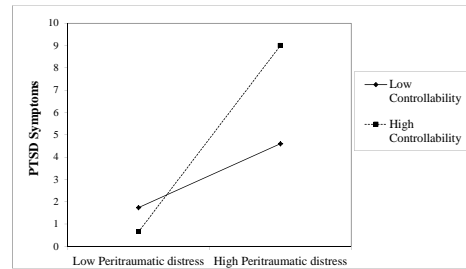
Self-worth and depression

- Main effects: WAS, PDI



Controllability and PTSD

- Main effect: PDI, not for WAS



Study 2:

Depression, PTSD, Cognitions and Distress

- What does this all mean?
 - ▣ Seems to be an additive effect between peritraumatic distress and benevolence of the world, self-worth
 - ▣ Those with more distress AND more negative assumptions about the world's benevolence and self-worth are at highest risk for depressive and PTSD symptoms

Study 2:

Depression, PTSD, Cognitions and Distress

- What does this all mean?
 - ▣ The additive effect seems to go in the opposite direction in terms of controllability
 - Those that experienced more distress and ended up with more POSITIVE beliefs that they can control world events were at highest risk for PTSD
 - The role of control of telecommunicators
 - ▣ How this places them at risk for PTSD

Study 2: Depression, PTSD, Cognitions and Distress

- Intervention?
 - Assess for:
 - Greater on-the-job distress in relationship to particularly upsetting calls
 - More negative "schema" changes – lowered beliefs that the world is benevolent and the self is worthy
 - Rigid beliefs that the world can and/or should be under one's control...
 - Danger of going in the opposite direction
 - On site debriefing or opportunities for breaks
 - Cognitive behavioral therapies that address emotions and cognitions that result from on-the-job trauma exposure

Study 3: Substance abuse and predictors

- Research has shown that military and paramilitary samples are at heightened risk for alcohol use problems
- Men in the general population have also been shown to engage in more problem drinking than women
- Is this related to job-related distress that needs to be alleviated, or is it a male-gendered norm for coping with distress?

Study 3: Substance abuse and predictors

- We can examine this question in telecommunicators, who also have a high rate of duty-related exposure to trauma and are predominantly female (or at least, in this sample and the few other research studies on this topic)

Study 3: Substance abuse and predictors

- Examined drinking via the MAST (Michigan Alcoholism Screening Test)
 - Average score: 5.18 ($SD = 1.89$)
 - Consistent with the categorization of "early or middle" problem drinker
 - Sorted based on cutoffs (0-3, 4-9, 10+) for full sample
 - 13.5% were not a problem drinker
 - 80.1% were early or middle problem drinker
 - 6.4% were probable problem drinker

Study 3: Substance abuse and predictors

- By gender – not a statistically significant difference

MALE			FEMALE		
Category	n	%	Category	n	%
Not a problem	4	9%	Not a problem	19	15%
Middle	33	77%	Middle	102	81%
Probable problem	6	14%	Probable problem	5	4%

Study 3: Substance abuse and predictors

- Gender differences
 - Women actually reported statistically MORE problem drinking than males when controlling for factors that have also been associated with level of drinking (education, ethnicity and age)

Study 3: Substance abuse and predictors

- How do female telecommunicators compare to women in the general population?
 - No difference in terms of heavy drinking
 - Large difference in terms of the middle category
 - 81% of female telecommunicators fell into this group
 - 22.9% in the general population (using a different measure) in one study; 9% in the general population in another study

Study 3: Substance abuse and predictors

- What puts one at risk for greater drinking problems?
 - Extent of exposure?
 - Years of service?
 - Anger?
- Hypothesized that all three would be associated with greater problem drinking

**Study 3:
Substance abuse and predictors**

	1.	2.	3.	4.	5.
1. MAST scores	-				
2. Trait anger	.28***	-			
3. State anger	.05	.29***	-		
4. Years of service	-.03	.16*	-.07	-	
5. Duty-related exposure	.05	.11	.12	.30***	-

**Study 3:
Substance abuse and predictors**

MALE

	1.	2.	3.	4.	5.
1. MAST scores	-				
2. Trait anger	.34*	-			
3. State anger	.09	.47***	-		
4. Years of service	-.18	-.10	.10	-	
5. Duty-related exposure	-.07	.12	.24	.42**	-

**Study 3:
Substance abuse and predictors**

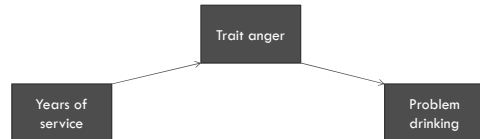
FEMALE

	1.	2.	3.	4.	5.
1. MAST scores	-				
2. Trait anger	.24**	-			
3. State anger	.01	.20*	-		
4. Years of service	.08	.24**	-.12	-	
5. Duty-related exposure	.17	.11	.09	.27**	-

- Study 3:
Substance abuse and predictors**
- For females, there was a significant relationship between years of service and trait anger, and a relationship between trait anger and problem drinking
 - Tested a mediation model:
 - A mediator is a variable that explains the relationship between two other variables

Study 3: Substance abuse and predictors

The following indirect effect model was statistically significant



Trait anger had a significant indirect effect on the relationship between years of service and problem drinking behaviors for both the full sample (95% confidence interval: .007 -.108) and the female subsample (95% confidence interval: .002 -.036)

Study 3: Substance abuse and predictors

Implications for intervention:

- Need to assess for alcohol abuse, not just dependence (alcoholism)
- May be some assumptions that those who “last” in the occupation can handle it, but the more years of service in this sample, the more trait anger was reported, and this was related to more problem drinking
- Need to remain committed to evaluating the mental health of seasoned veterans

Summary

- Telecommunicators in this sample experienced:
 - A lot of exposure to potentially traumatizing, duty-related events
 - Intense emotional reactions in response to many calls, and many different types of calls
 - Symptoms of psychopathology that were:
 - Not inconsistent with the general population
 - Still notable and perhaps indicative of subthreshold clinical diagnoses
 - Likely an underestimate of the true extent of struggles

Limitations

- Research sample was self-selected, survey was self-report
 - Convenience sample of people willing to spend their own time (30-90 minutes) completing a measure for no reimbursement
 - Pitfalls of self-report
- Research sample was relatively small (171 out of 200,000 nationwide) and majority female
- Cross-sectional and reports were largely retrospective

Limitations

- Research sample included only current TCs
 - Therefore, doesn't include those that:
 - Didn't make it through training
 - Left the occupation/career voluntarily
 - Relatedly, left the occupation/career because of stress, distress, mental health, etc.
 - Left the occupation/career involuntarily
 - Administrators (some enrolled, but didn't see the questions as currently relevant to them)
 - Likely underestimates of those that have struggled with mental health issues

Strengths

- It seems like it was needed
- Strengths:
 - Decent sample size and folks were willing to do it
 - Provides some preliminary evidence that has raised some awareness
- Provides preliminary, scientific evidence that:
 - Being a 911 telecommunicator can be emotionally distressing (or at least, aspects of it)
 - Some of this emotional distress is related to mental health problems (symptoms of PTSD, depression, alcohol abuse, etc)
 - There are some things that we can start to identify as implicated in who does and does not struggle with mental health
 - Some PRELIMINARY implications for prevention and intervention

Future steps

- Will be applying for a grant in the fall that would hopefully continue research in this area, starting next summer
- Future research will try to address some of the shortcomings of this research:
 - Longitudinal design (first two years of work)
 - A "less convenient" sample (cast a wider net and try to approach as many as possible)
 - Secondary sources (supervisors, partners/spouses)
 - Also examine non-duty-related trauma
 - More focus on the role of agencies/centers in promoting or exacerbating mental health
 - How do we prepare telecommunicators and how do we intervene when the inevitable happens (i.e., a particularly upsetting call or event)?

Future steps

- Things to consider examining:
 - Shift work
 - Cognitive overload
 - Physical health
 - Lack of resolution on calls
 - Debriefing
 - NG 9-1-1 (<http://www.its.dot.gov/nq911/>)

Questions?

Sample:
Trauma exposure outside of work

Type of trauma	Percent exposed
Natural disaster	69%
MVA with injury or fatality	44%
Other type of accident	24%
Unexpected death of friend/loved one	85%
Loved one survived illness or accident	67%
Self experienced life threatening illness	26%
Robbed or present during robbery	17%
Seen other getting beaten up	22%

Sample:
Trauma exposure outside of work

Type of trauma	Percent exposed
Beaten up by a stranger/acquaintance	17%
Threatened harm by another	40%
Childhood physical abuse	20%
Witnessed family violence	31%
Personally experienced family violence	41%
Sexually assaulted in adulthood	12%
Sexual harassment	34%
Stalked	34%

Sample:
Trauma outside of work

Total trauma exposure	Minimum	Maximum	Mean	Standard Deviation
Childhood sexual abuse	0	16	2.06	3.84
Trauma exposure	1	53	17.29	11.03
Interpersonal trauma exposure	0	37	7.69	8.30
Non-interpersonal trauma exposure	1	26	9.70	5.45