Examining Sentiment and Depression in Survivors of Intimate Partner Violence

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Introduction: Intimate partner violence (IPV) and depression are two of the most well-documented psychosocial stressors faced by perinatal women, with estimates of 3.9%-8.3% IPV and 7.1%-12.7% depression. Each present immediate as well as long-term health risks to both the woman and her infant. Because IPV and depression often go hand-in-hand, their impact is cumulative and each can exacerbate the consequences of the other.

We hypothesize that language analysis can be used effectively as a preliminary screening tool in a clinical environment.

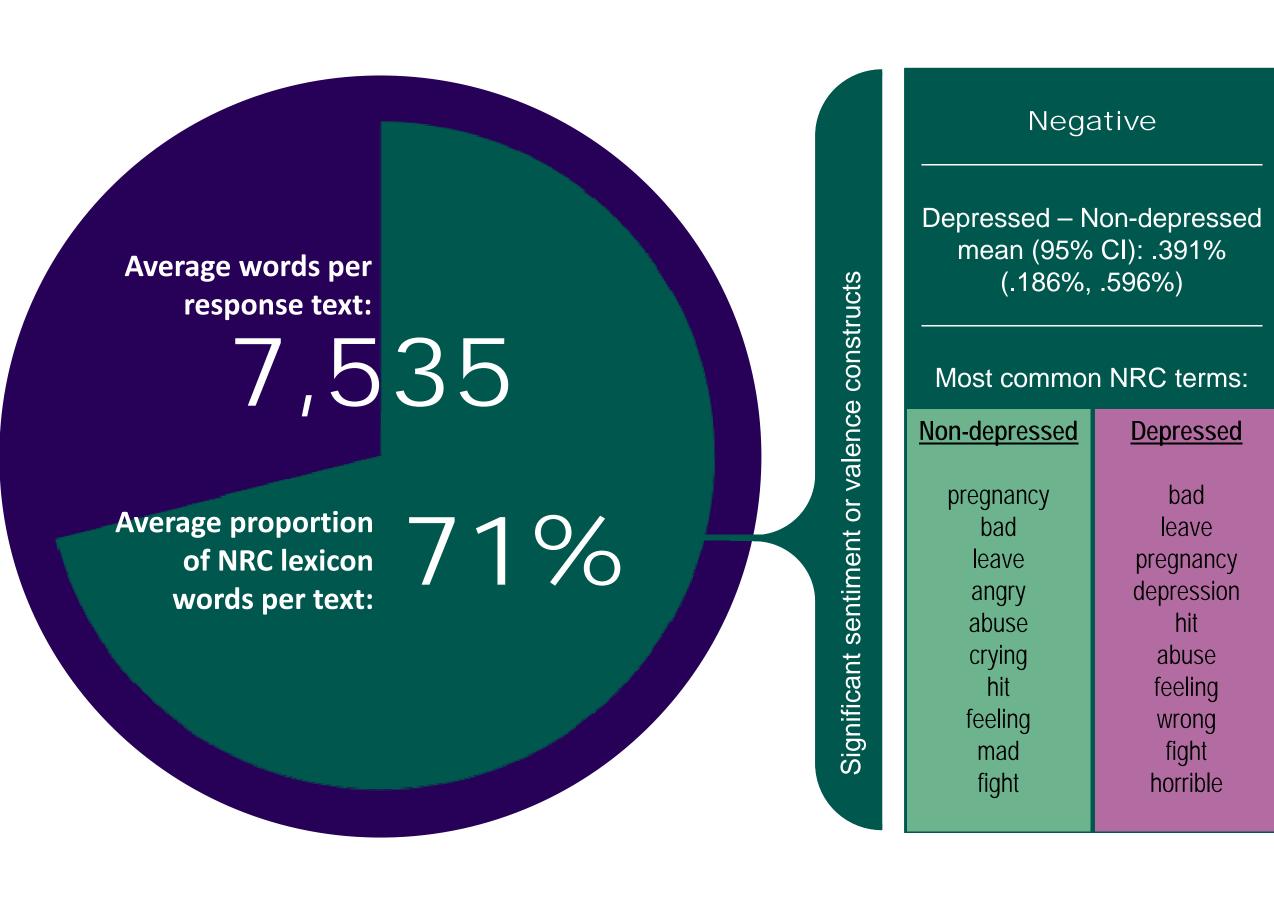
Methods: This mixed methods analysis combined quantitative results from a community-based survey study (Kothari, 2014) of 326 postpartum women. IPV was assessed via phone interview using three questions for current or past emotional or physical abuse:

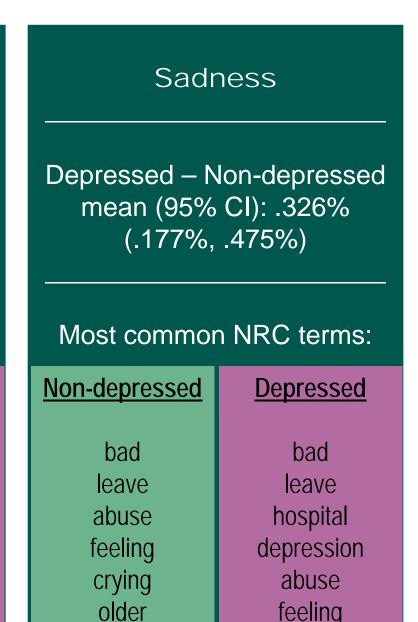
- Q1: "Have you ever felt afraid at home because of threats of violence?"
- Q2: "Have you ever had a partner or spouse who got very jealous or tried to control your life?"
- Q3: "Have you ever had a partner that pushed, hit, kicked, or otherwise physically hurt you?"

Sixty-four women screened positive, and 31 interviews were subsequently completed, taped, and transcribed. Additionally, women were asked a series of questions detailing the nature and timing of the abuse, and screened three times for depression using the Edinburgh Postnatal Depression Scale (Cox et al, 1987); a validated perinatal depression screener.

Multiple bivariate analyses were used to assess the relationship between depression and the frequency of emotional words. The National Research Council Canada (NRC) Word-Emotion Association Lexicon (Mohammad, 2013) was used to establish percentage of sentiment words within each transcribed interview. Two sample t-tests assess differences in the proportion of each emotion and sentiment category between positive and negative major depressive disorder cohorts. Resampling-based permutation tests were performed, generating 10,000 samples to confirm these findings while allowing for the potential for failure of distributional assumptions. The Bonferroni correction adjusted for multiple testing. Simple linear regressions were used to evaluate the relationship between the maximum depression score and the proportion of each emotion and sentiment category.

Results: Women with major depressive disorder used a greater proportion of words associated with negativity (p=0.0005), anger (p=0.0049), disgust (p=0.0027), fear (p=0.0047), sadness (p=0.0012), and a smaller proportion of trust words (p=0.0232). Permutation hypothesis tests confirm findings that the average word proportions for negative (p=.0004), anger (p=.0057), disgust (p=.0007), fear (p=.0009), and sadness (p<.0001) significantly differ for depressed versus non-depressed, while trust (p=.0862) was found to be marginally significant. Regression analyses revealed that negativity (p=0.0031), anger (p=0.0407), disgust (p=0.0015), fear (p=0.0004), sadness (p=0.0003), and trust (p=0.0187) were significant in individually predicting maximum depression score.



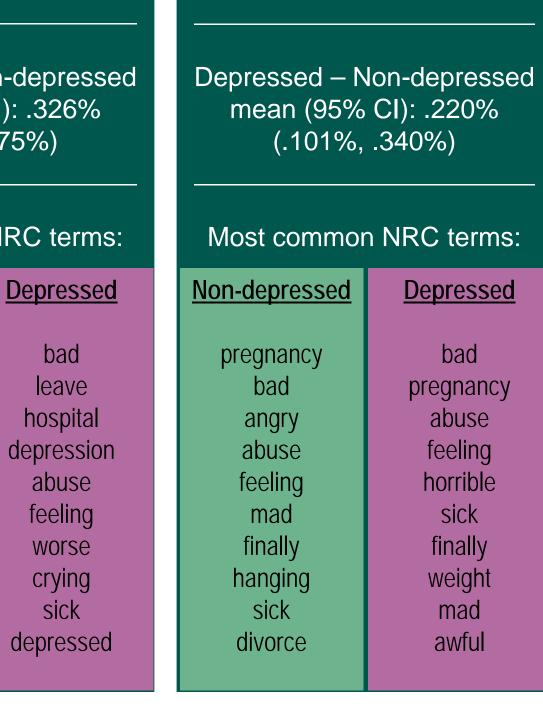


mad

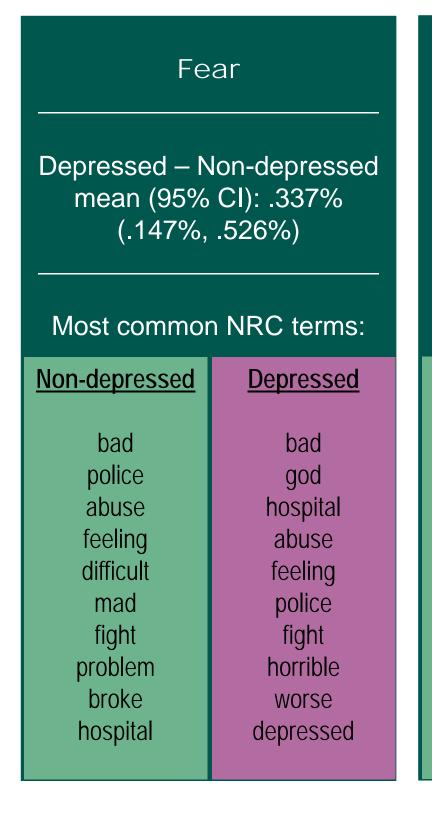
problem

broke

hospital



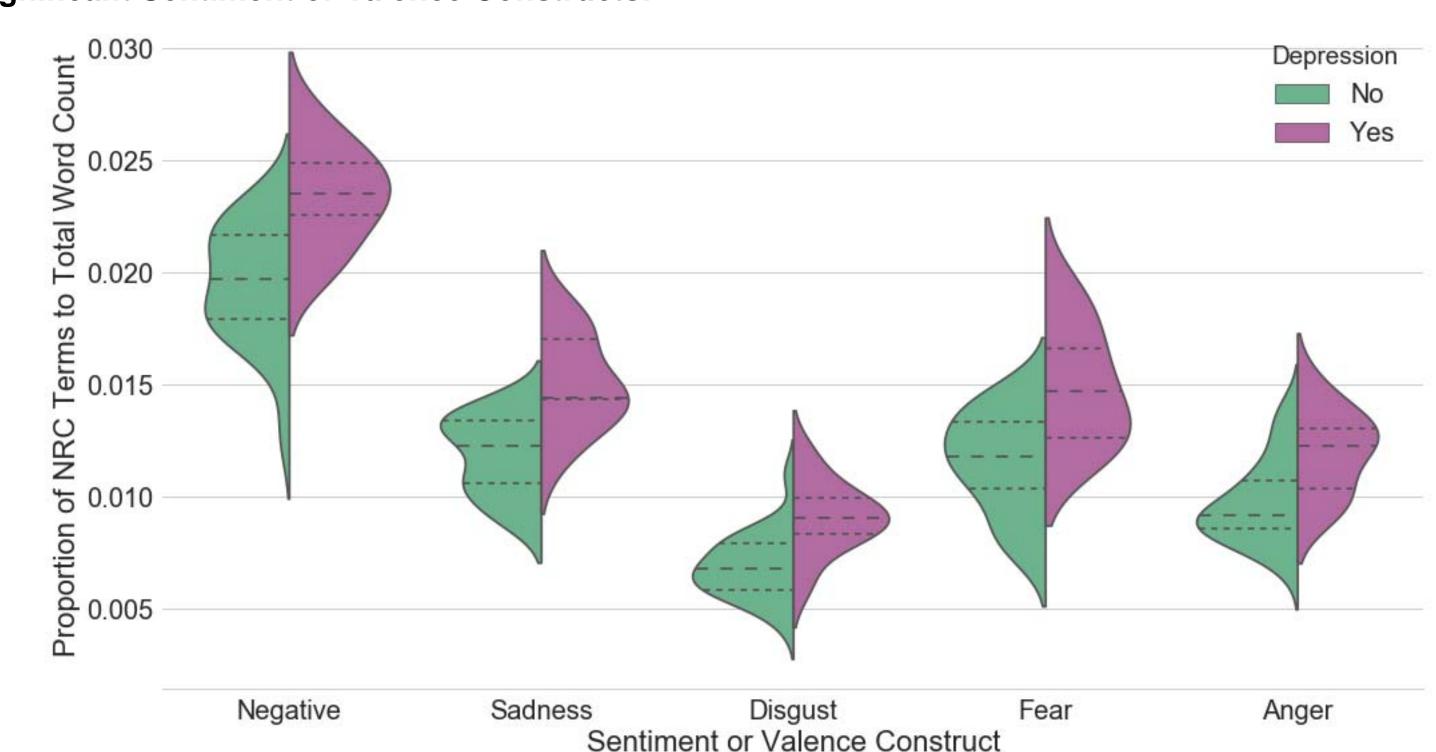
Disgust



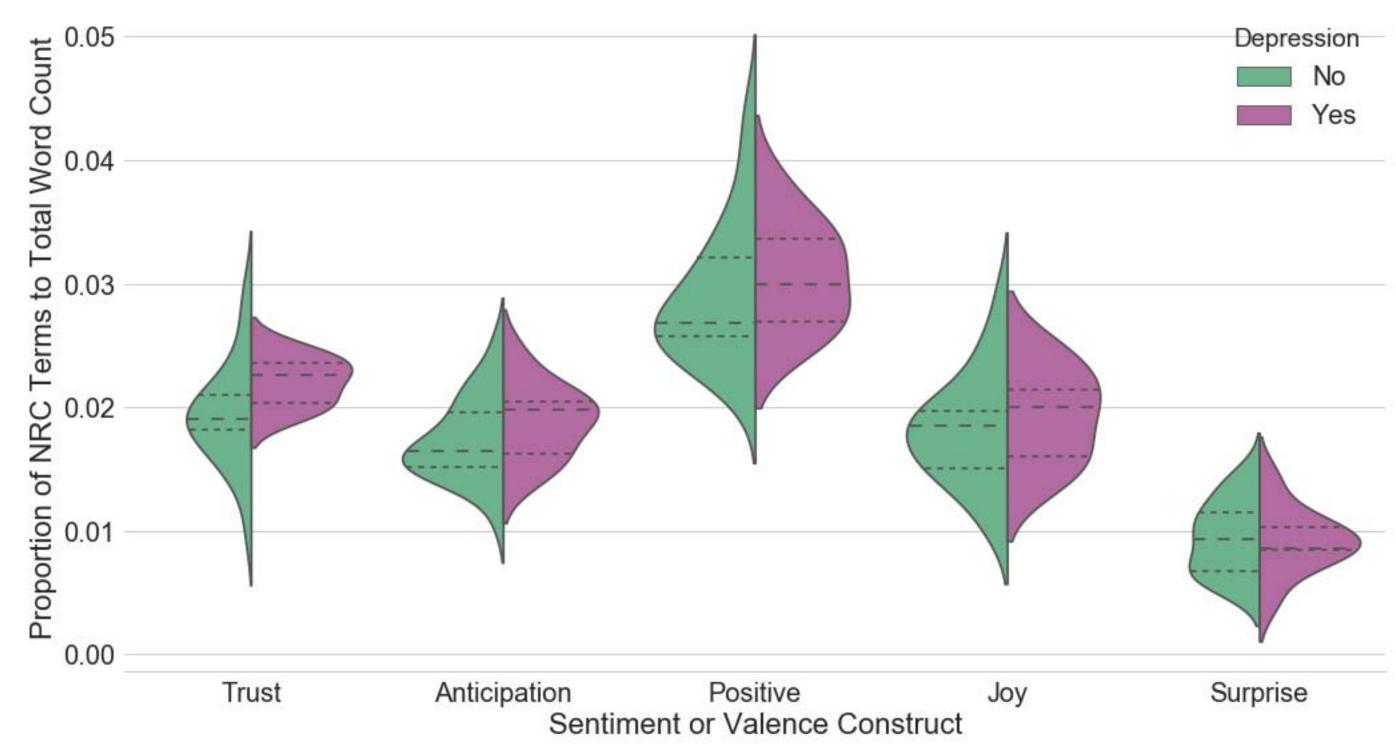
Anger Depressed – Non-depressed mean (95% CI): .223% (.734%, .372%)	
	n NRC terms:
Non-depressed	n NRC terms: <u>Depressed</u>
Non-depressed	<u>Depressed</u>
Non-depressed bad money angry	Depressed bad money hit
Non-depressed bad money angry abuse	Depressed bad money hit abuse
bad money angry abuse hit	Depressed bad money hit abuse feeling
bad money angry abuse hit feeling	Depressed bad money hit abuse feeling fight
bad money angry abuse hit feeling mad	Depressed bad money hit abuse feeling fight horrible
Non-depressed bad money angry abuse hit feeling	Depressed bad money hit abuse feeling fight

Smoothed Distribution of Proportion of NRC Sentiment or Valence Words, Depressed vs. Non-depressed.

Significant Sentiment or Valence Constructs:



Non-significant Sentiment or Valence Constructs:



Results, continued: Bivariate regression estimates reveal that for every .01% increase in proportion of negative, anger, disgust, fear, sadness, and trust words, respectively, we expect an increase in maximum post-natal depression score of 8.86, 9.38, 16.31, 11.41, 13.59, and 5.72.

Discussion: Underlying psychological maladies may have psychosomatic complaints manifest. Our goal is to develop more sensitive intake procedures. Victims of IPV may present their narrative in myriad ways to providers and may need counseling support earlier in their medical visit. We posit that this analysis in entirety is a first step towards building more robust studies around domestic violence screening measures using sentiment analysis. As it's unreasonable to conduct a full-scale structured interview with each patient during intake, our study points towards identifying appropriate screening questions for providers to ask patients and key terms to listen for during exams.

References:

Kothari, C. L. (2014). **The Intersection of Depression, Partner Violence and Poverty During the Perinatal Period.** (Unpublished doctoral dissertation.) Western Michigan University, Kalamazoo Michigan.

Cox, J. L., Holden, J. M. & Sagovsky, R. (1987) **Detection of postnatal depression.** Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry, 150, 782 -786.

Mohammad, S., Turney. P. **Crowdsourcing a Word-Emotion Association Lexicon**. Computational Intelligence, 29 (3), 436-465, 2013. Accessed via Jockers, ML. (2015). Syuzhet: Extract Sentiment and Plot Arcs from Text. https://github.com/mjockers/syuzhet.



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