

Distinguishing Positive and Negative Aspects of Solitude in Tweets

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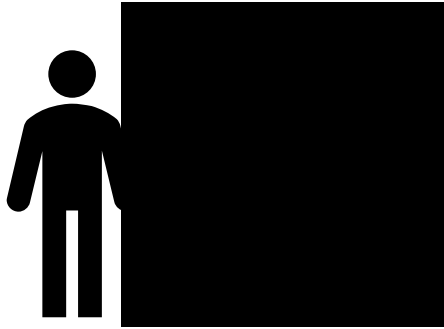
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Alone



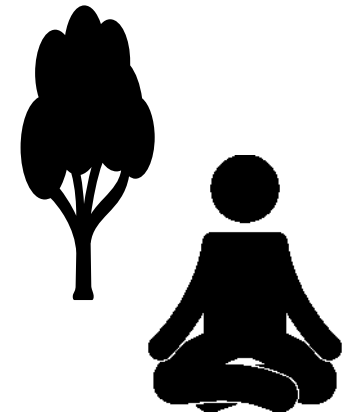
- Physical/social separation
- Neutral?

Lonely



- Negative appraisal
- Stress
- Externally imposed

Solitude



- Positive appraisal
- Deactivating
- Intrinsically motivated



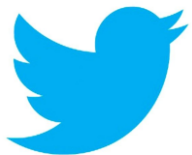
$N = 19,283,288$ tweets containing either
'solitude', 'lonely', 'loneliness', 'lonesomeness',
'alone', 'aloneness'

- Aug. 28, 2018 - Jul. 10, 2019.



"I come home tired hungry. Not a person is here to welcome me...
#sad #tired #lonely"

"I been enjoying my solitude today so much ...sweet melodies of
soundscapes playing all day. ✨💖😊🧘♀️ #InMyZone"



"Solitude has it's benefits... ... But being alone for a long time can be
pretty damaging."



Q1: Which words uniquely co-occur with different Solitary Terms?

$$\text{PMI}(x; y) = \log \frac{p(x, y)}{p(x)p(y)}$$

$$\text{PMI}(\text{solitude}; \text{calm}) = \log \frac{p(\text{solitude}, \text{calm})}{p(\text{solitude})p(\text{calm})}$$

$$\text{PMI difference} = \text{PMI}(\text{solitude}; \text{calm}) - \text{PMI}(\text{lonely}; \text{calm})$$



Q1: Which Words Co-occur with Solitude or Lonely?

Solitude

recharge
tranquility
fortress
meditation

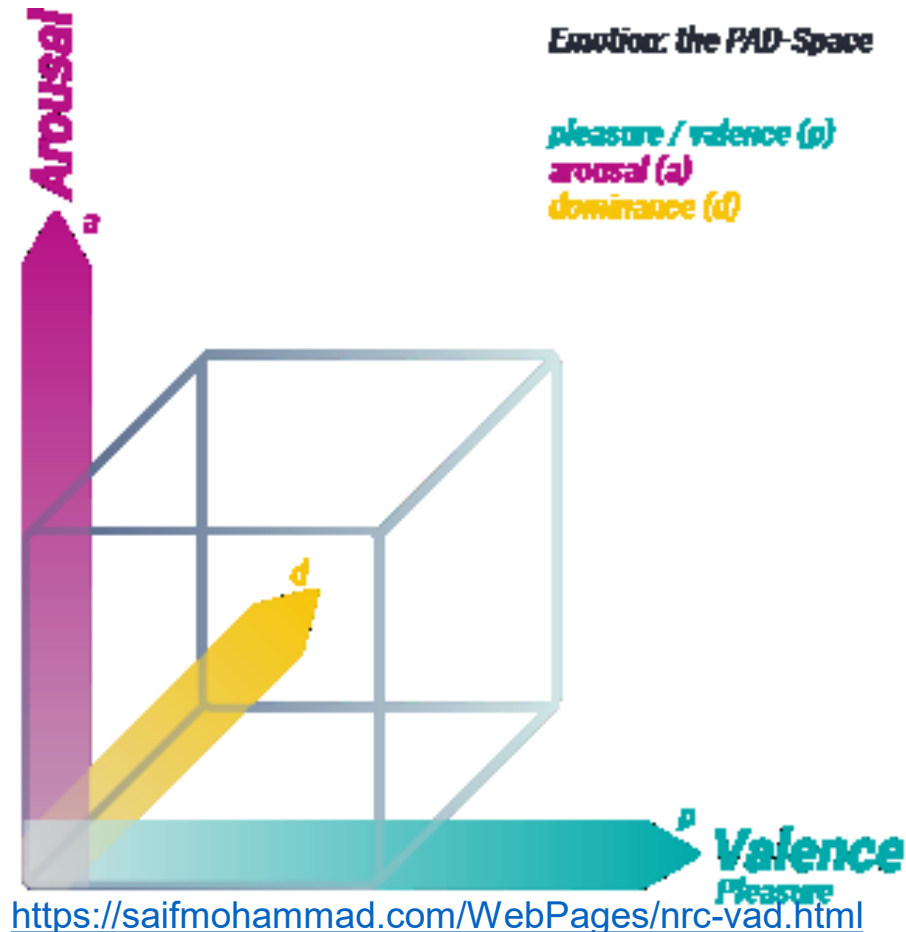
Lonely

depressed
sergeant + pepper
bored
horny



Q2: Do words that co-occur with Solitude vs. Lonely differ in emotional features?

- **Valence**: Pleasantness vs. Unpleasantness.
- **Arousal**: Activation vs. Deactivation (e.g., tense vs. calm).
- **Dominance**: Powerful vs. weak (e.g., in control vs. out of control).
- We used the NRC VAD lexicon¹ to quantify affect for over 20,000 different words.

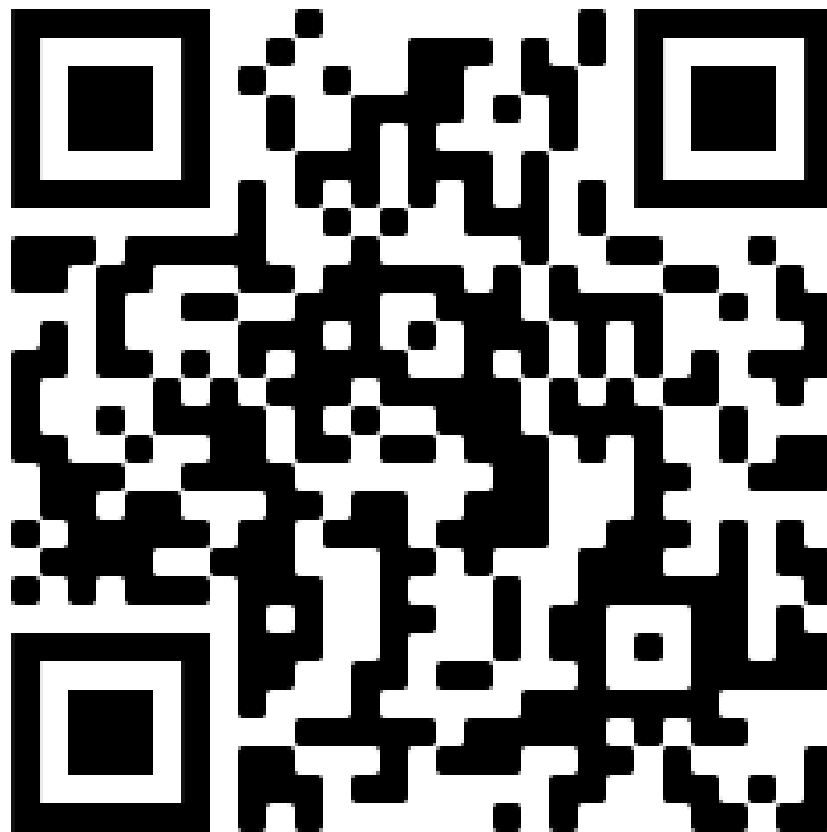


Osgood et al. (1958), Russell (1980, 2003); Mohammad (2018)¹



Try our interactive app to play with the results!

whipson.shinyapps.io/Solitude_Tweets/



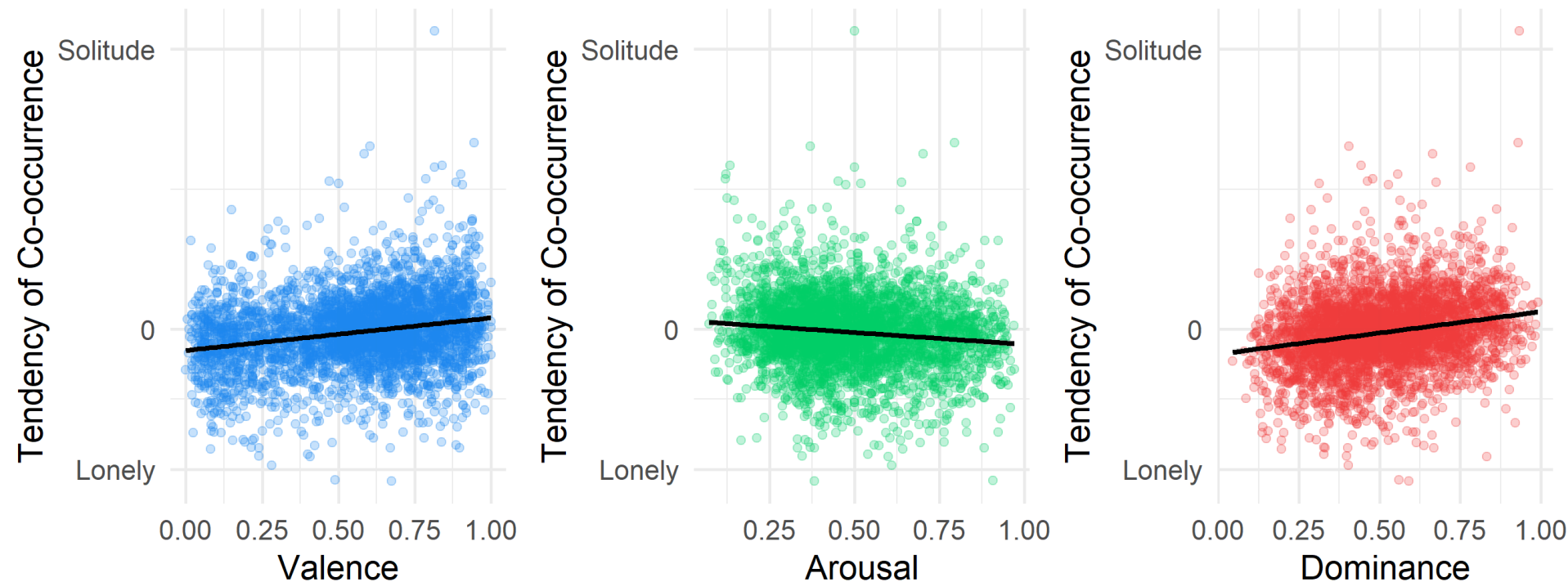


Figure 1. Likelihood of co-occurring with **Solitude** vs. **Lonely** in relation to Valence, Arousal, and Dominance.

Notes: Using ≥ 500 occurrences.

β	p	β	p	β	p
.698	< .001	-.508	< .001	.901	< .001

Interactive version: https://whipson.shinyapps.io/Solitude_Tweets/



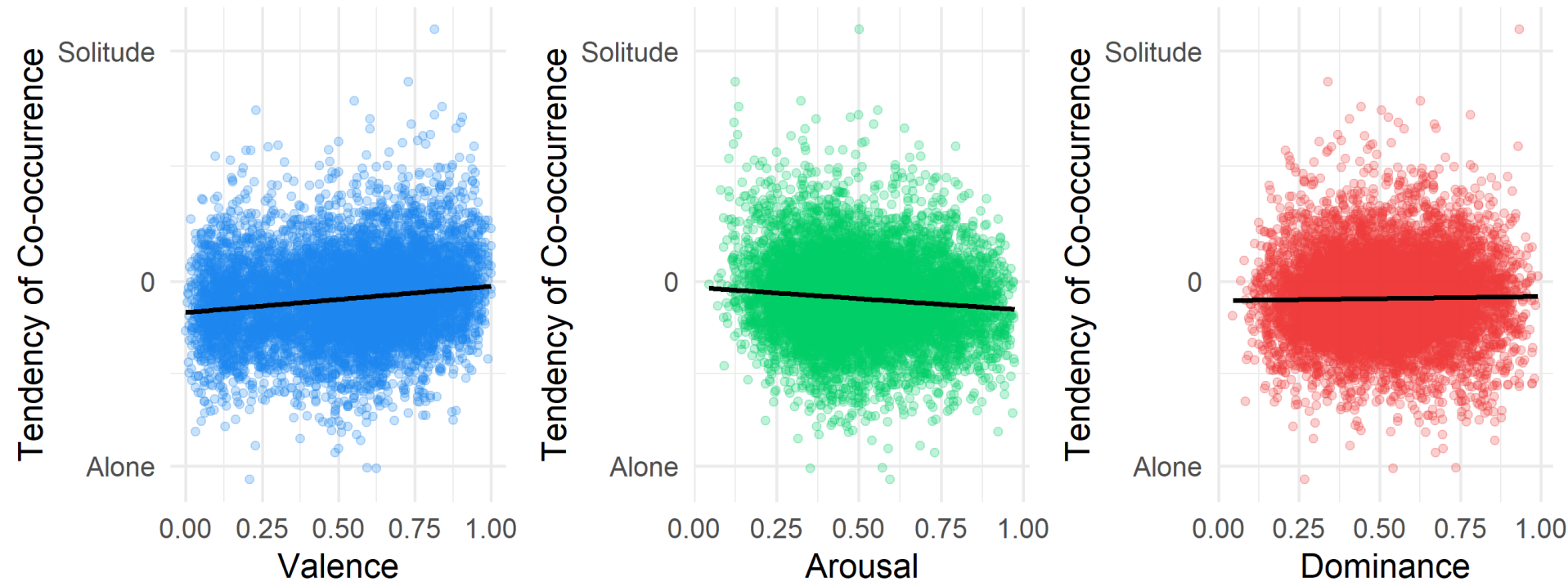


Figure 2. Likelihood of co-occurring with **Solitude vs. Alone** in relation to Valence, Arousal, and Dominance.
Notes: Using ≥ 500 occurrences.

β	p	β	p	β	p
.571	< .001	-.491	< .001	.090	.012

Interactive version: https://whipson.shinyapps.io/Solitude_Tweets/



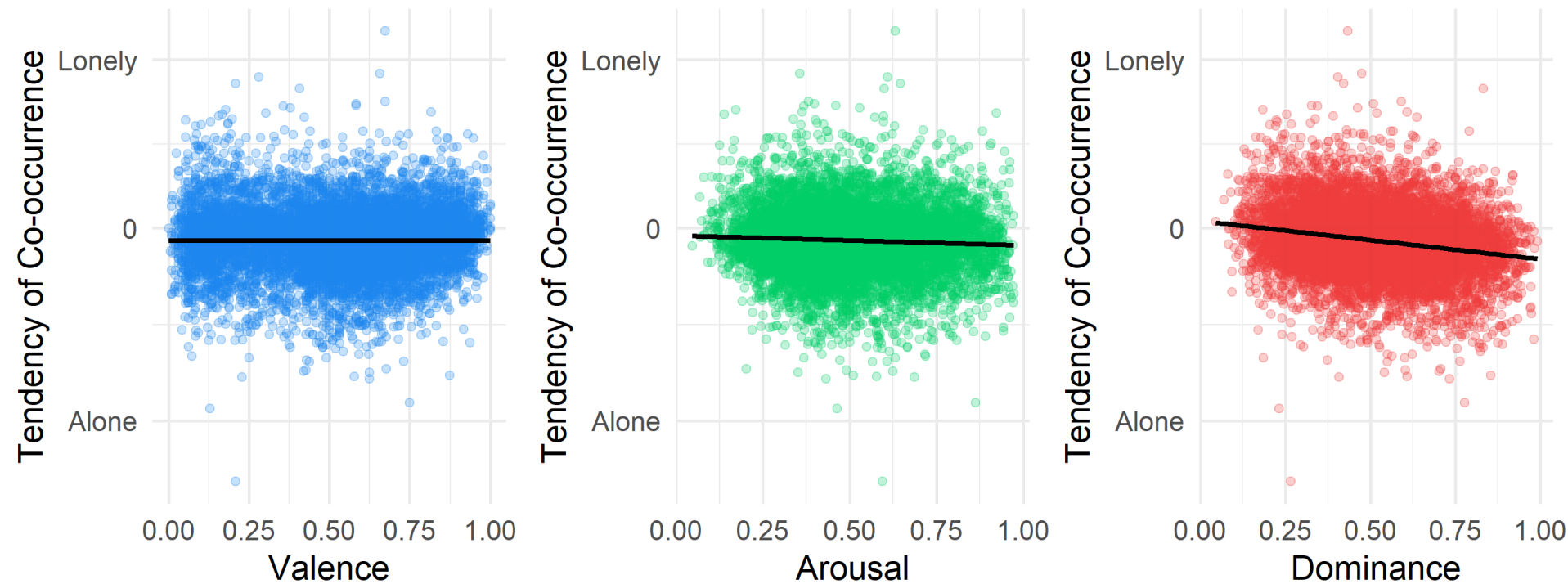


Figure 3. Likelihood of co-occurring with **Lonely vs. Alone** in relation to Valence, Arousal, and Dominance.

Notes: Using ≥ 500 occurrences.

β	p	β	p	β	p
-0.005	.520	-0.204	.001	-0.797	< .001

Interactive version: https://whipson.shinyapps.io/Solitude_Tweets/



Solitude occurs in the context of higher **valence**, lower **arousal**, and higher **dominance** words.



- Positive appraisal
- Deactivating
- Intrinsically motivated

Lonely occurs in the context of lower **valence**, higher **arousal**, and lower **dominance** words.



- Negative appraisal
- Stress
- Externally imposed

- *Alone* is somewhere in between *solitude* and *lonely*.



“Sea of **Solitude** is a game I’m SO looking forward to 😍😍😍”

- Context matters!
- NLP doesn’t necessarily reflect *felt* emotion.
- Could (should) we use NLP to identify people at risk of loneliness?





Thank you!

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Slides & R Code

<https://github.com/whipson/SPSP2020-solitude-tweets>

Interactive app

https://whipson.shinyapps.io/Solitude_Tweets/

