



Distinguishing Positive and Negative Aspects of Solitude in Tweets

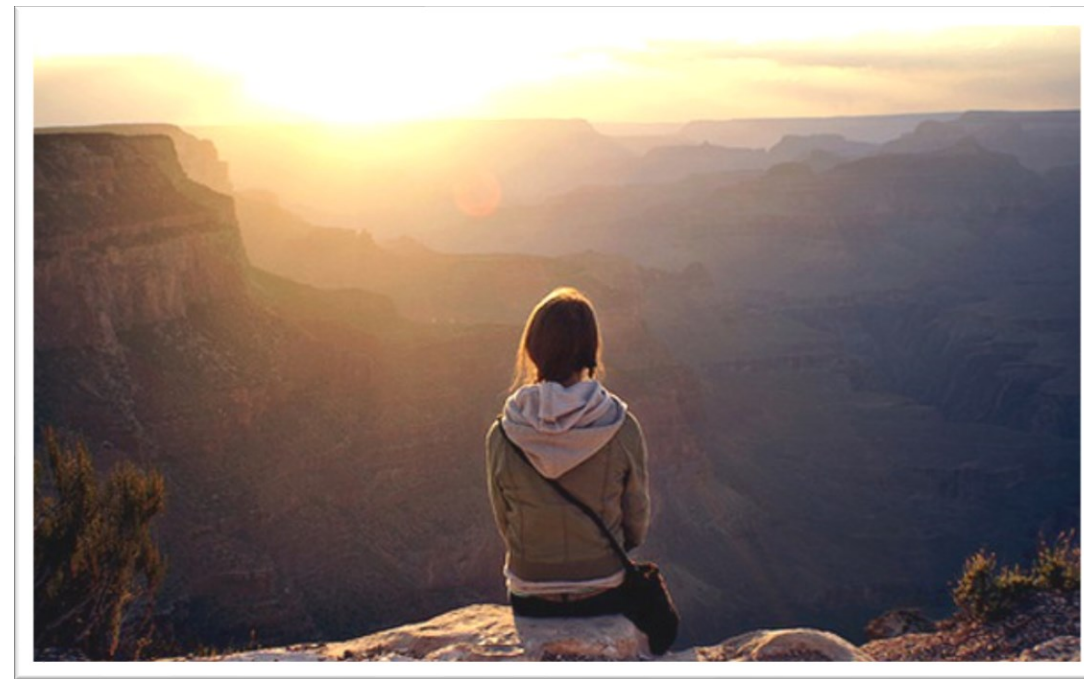
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What does it mean to *Be Alone*?



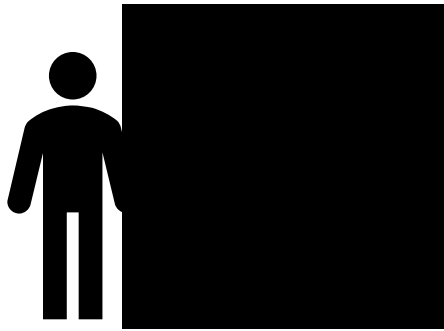


- Dissatisfaction with social relationships.
- Externally imposed.
- Negative consequences (e.g., depression).



- Preference for solitude.
- Intrinsically motivated (SDT).
- Positive consequences (e.g., rejuvenation)?

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. I do have a family. #sad #tired #lonely”

“I been enjoying my solitude today so much that I have had the sweet melodies of soundscapes playing all day. ✨💕
😊🧘 #WooMfckinSAH #InMyZone”



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

Which words uniquely co-occur with different Solitary Terms?

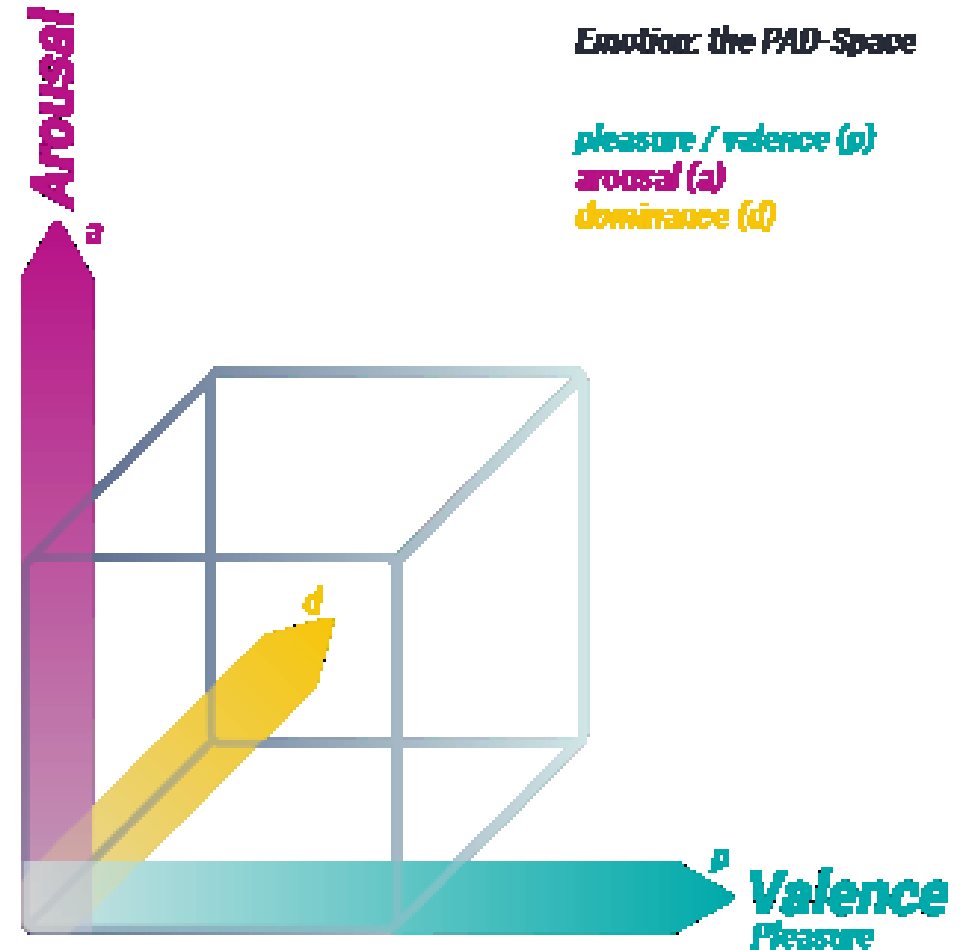
$$\text{PMI}(x; y) = \log \frac{p(x, y)}{p(x)p(y)}$$

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

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

Affect is 3-Dimensional^{1,2}

- **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 lexicon³ to quantify affect for over 20,000 different words.



The Current Study

- How are the terms *lonely*, *alone*, and *solitude* used in online language?
- What is the emotional context of these terms?
 - I.e., do co-occurring words vary in valence, arousal, and dominance?
- Exploratory, but we expected *solitude* to be higher **valence** (pleasant), lower **arousal** (deactivating), and higher **dominance** (intrinsic motivation) compared to *loneliness*.

Try our interactive app to play with the results!

whipson.shinyapps.io/Solitude_Tweets/



Which Words Co-occur with Solitude or Lonely?

Solitude

recharge
tranquility
fortress
meditation

Lonely

depressed
sergeant + pepper
bored
horny

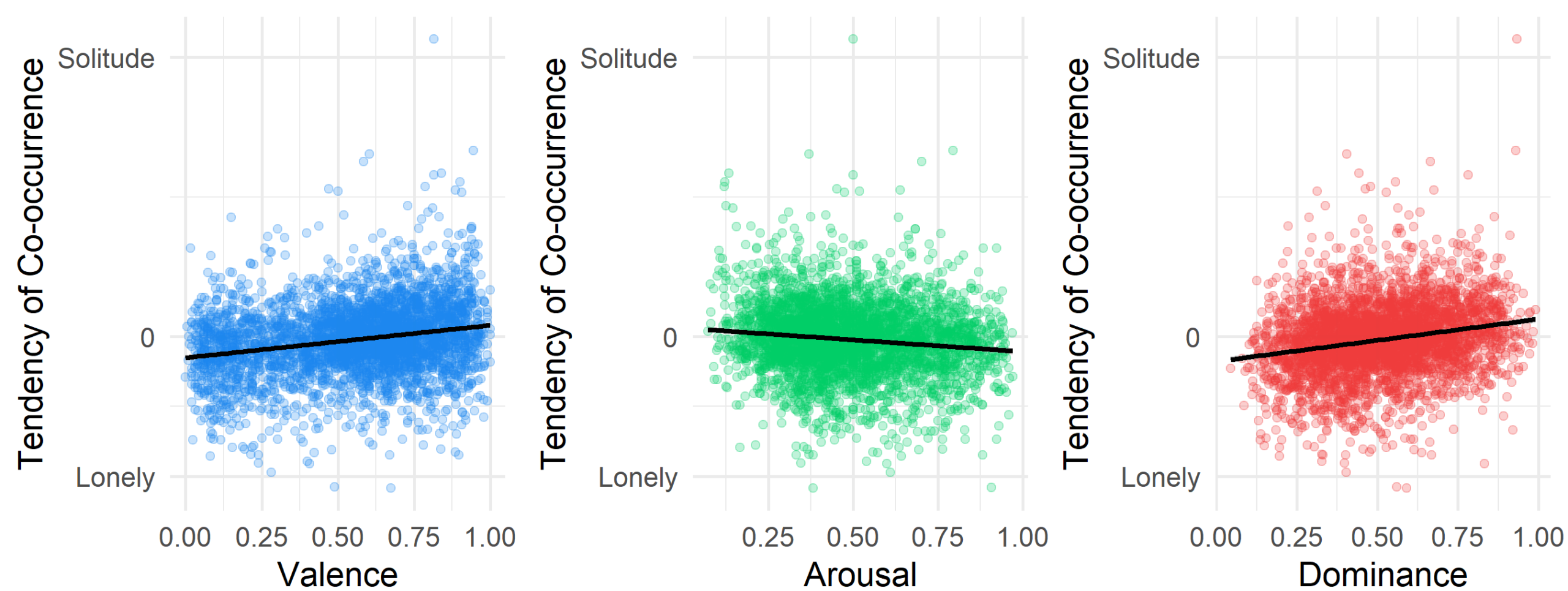


Figure 1. Likelihood of co-occurring with **Solitude** vs. **Lonely** in relation to Valence, Arousal, and Dominance.
Notes: Using ≥ 500 occurrences.

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

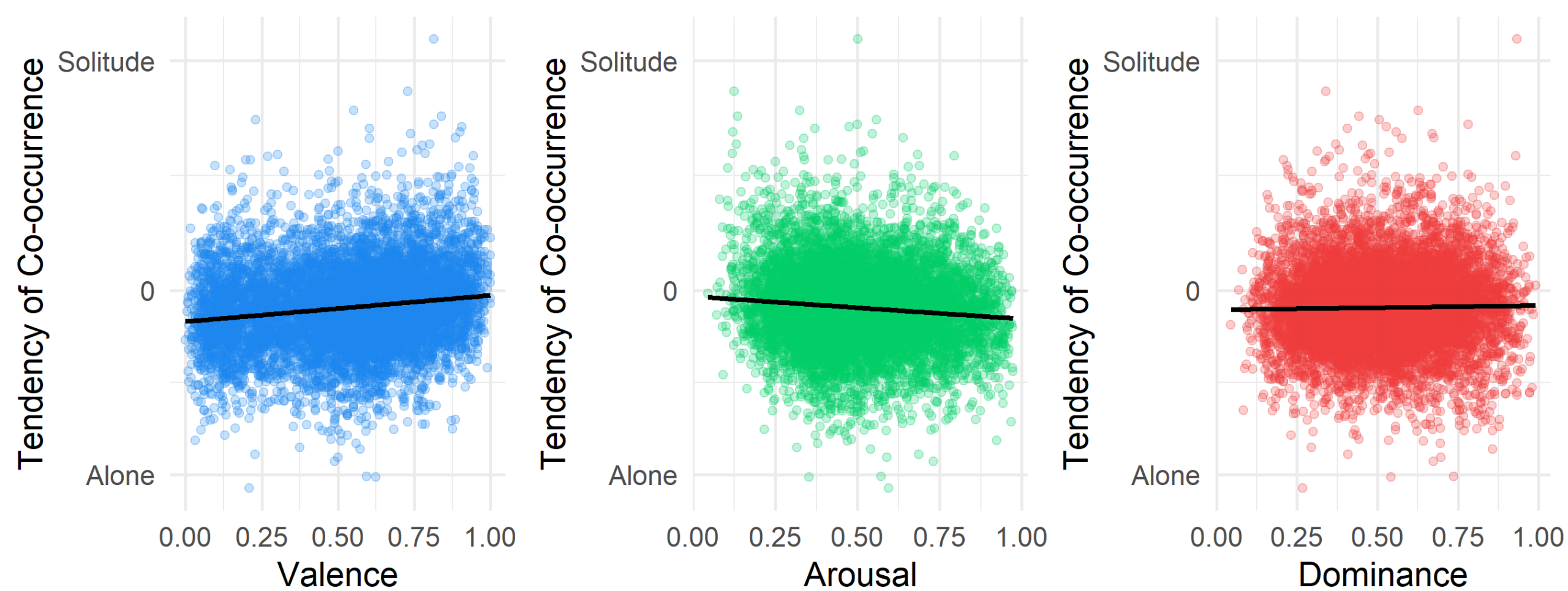


Figure 2. Likelihood of co-occurring with **Solitude** vs. **Alone** in relation to Valence, Arousal, and Dominance.
 Notes: Using ≥ 500 occurrences.

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

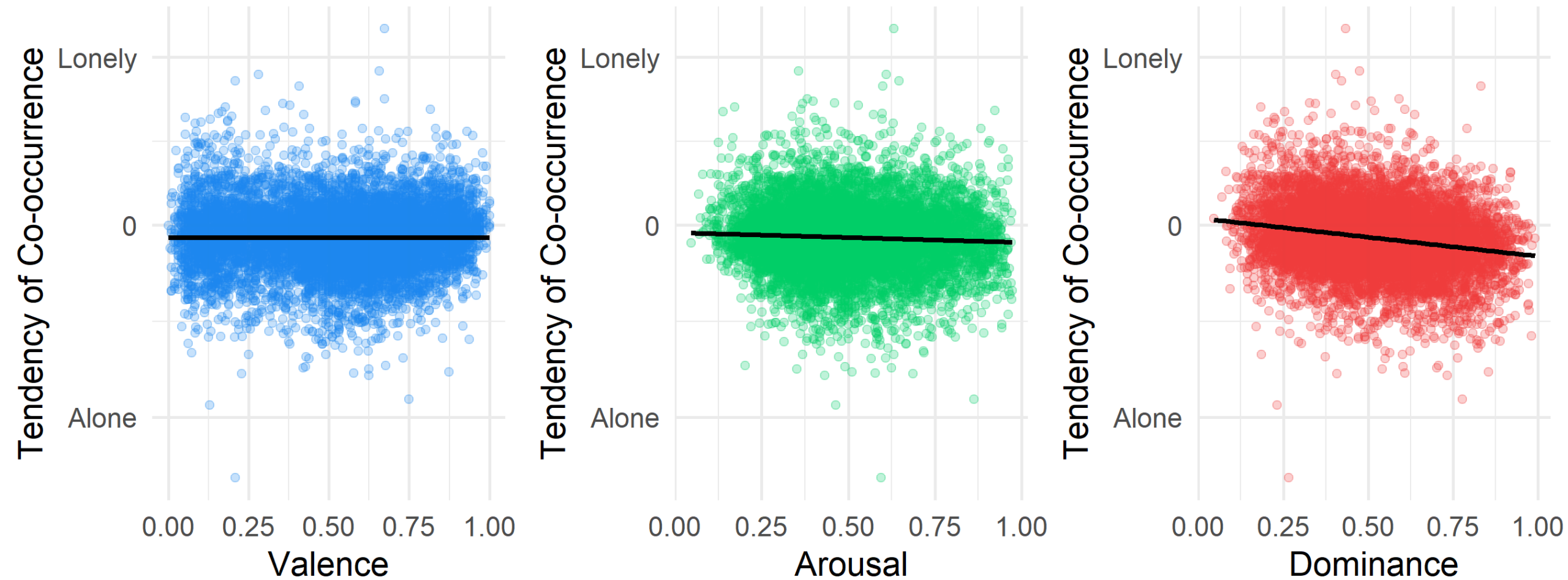


Figure 3. Likelihood of co-occurring with **Lonely** vs. **Alone** in relation to Valence, Arousal, and Dominance.

Notes: Using ≥ 500 occurrences.

β	p	β	p	β	p
-0.005	.520	-.204	.001	-.797	< .001

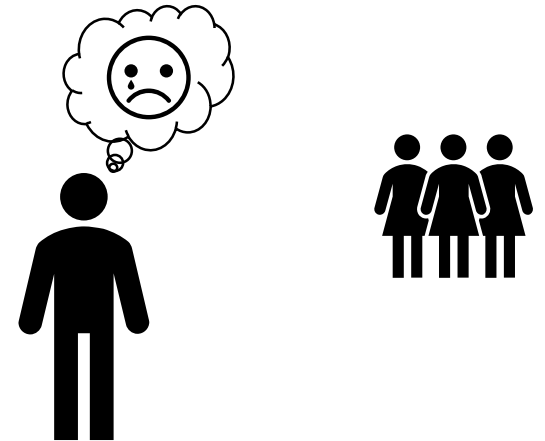
Discussion

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.



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

- Negative appraisal
- Stress
- Externally imposed

Limitations and Future Directions

- Context matters!



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

- NLP doesn’t necessarily reflect *felt* emotion.



“This platform created expectations so unrealistic that we rather be **lonely** than create sustainable relationships through trial and error.”

- Could (should) we use NLP to identify people at risk of loneliness?



Questions?

Slides available:

https://github.com/whipson/Health_Social_19.11.22